

# ComputerWeekly

Thursday, February 19, 1981

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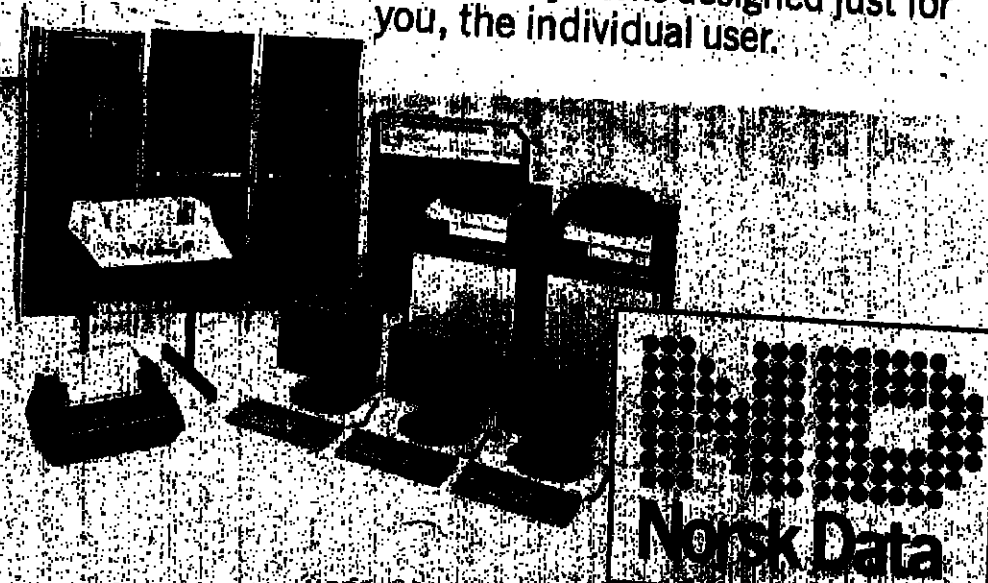
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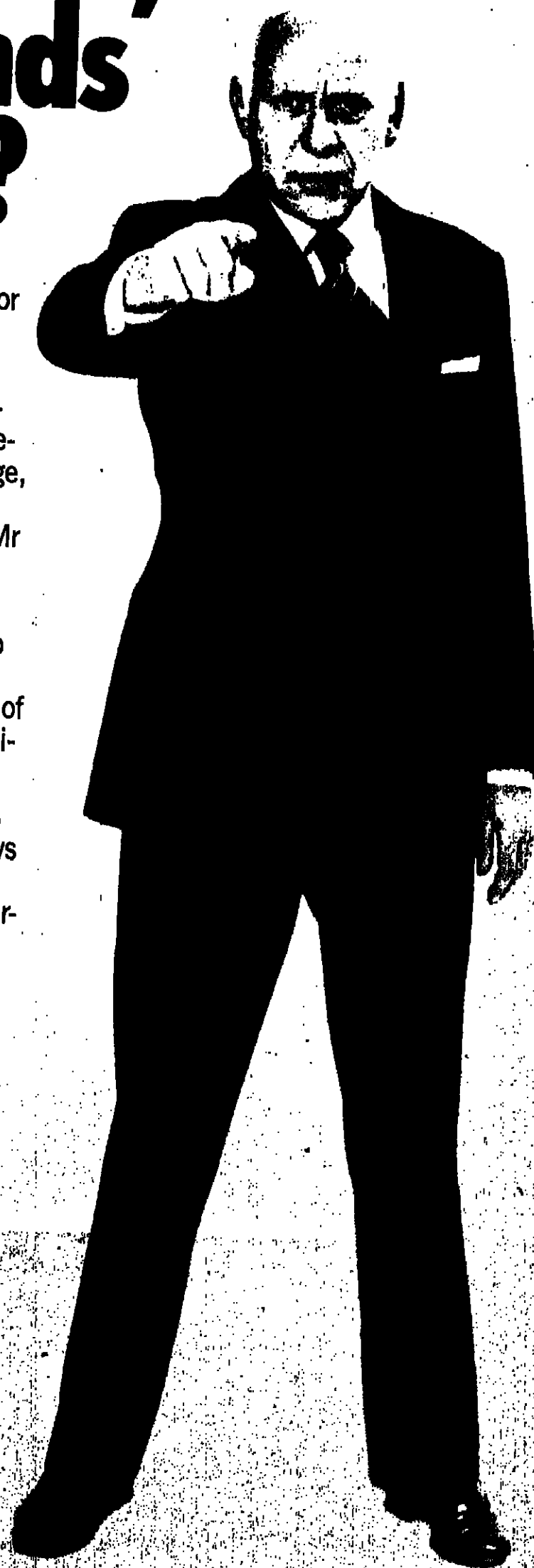
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## Honeywell puts the accent on security

by Keith Jones  
INCREASED security is the main feature of a group of new systems software products announced by Honeywell for its Level 64/DPS medium-scale mainframe line. New hardware features include an increase in main memory size from two to four megabytes and a 1200-megabyte per spindle drive, the MSU 0555.

There is also a new package of software aids called Transit for translating files and programs of IBM, ICL, NCR, Burroughs and Univac systems into 64/DPS files.

This latest group of enhancements for Level 64 follows closely

on the launch of the Datanet 8 network processor which handles all data communications on behalf of a 64/DPS host and forms part of the Honeywell Distributed Systems Architecture which was formally unveiled last October.

One of the new systems software products, Systems Access Rights, is an optional extension to the GCOS operating system which allows the owner of a file to define various levels of access rights to other users. Another, General Access Control, allows protected access to the same file simultaneously from batch jobs, transaction jobs and interactive users.

Honeywell says that it automatically resolves conflicts which may arise when two or more users attempt to update the same record or page of a file.

A third new product, Interactive Resource Monitor, is designed to increase the amount of interactive work that can be processed using the same memory resources.

Also new is System Behaviour Reporter which monitors and analyses the usage of Level 64 systems resources and records all information in graphical form.

Level 64 machines are manufactured in France by CII-Honeywell Bull at Anger.



The Wangwriter comes to the UK

## UK launch of Wang entry in low-cost word processor war

by Rory Johnston  
WANG's entry in the low-cost word processor war, the Wangwriter, has now been launched in the UK, with deliveries to the Massachusetts supplier's existing large customers starting in June. A special sales organisation is to be set up by Wang in the summer to deal with small, first-time users, of whom the company estimates there are 5 million worldwide and only 5% currently have word processors.

The General Business Systems organisation, as it will be called, will also sell minicomputers. While first-time users are an important future business, for the moment 60% of Wangwriter sales are expected to go to small departments and branches of large firms.

The Wangwriter, costing £4,350, is a stand-alone screen word processor with for the time being only a single mini-floppy disc drive. Thus the taking of security copies has to be done one document at a time, a cumbersome

process. A new relatively slow design of daisy wheel printer is included in the price, with the unusual feature of ejecting the paper underneath.

Wang is following IBM's lead in minimising the training and support provided for a machine that it sees very much on a "plug it in and use it" basis. Purchasers are provided with self-teaching programs and diagnostic discs to help trace hardware faults. Most support is expected to be done by telephone.

Operating procedure is similar to Wang's existing ranges of word processors but in a departure from the company's policy hitherto the machine is not directly compatible. Thus transferring documents from the Wangwriter to an OIS word processing system requires attachment of a special 'Minidiskette Workstation' to the OIS, since the latter does not use these discs. The workstation, with its screen, keyboard and disc drive can also be used for editing.

## Hitachi responds to 3081

From front page  
Other key features of the air-cooled M200H include a main memory expandable up to 32 megabytes and up to 32 channels. No announcement has been made yet about the marketing of the M200H in the West by any of the three firms that already sell IBM compatible versions of the M180 and M200H - National Advanced Systems, BASF and Olivetti.

Much further down the performance scale, Hitachi has launched a second machine, the M240H, which is said to offer up to four times the performance of the M160H. The latter computer, which has been around for several years, roughly matches the now obsolete IBM 370/145.

An IBM 3380 compatible version of Hitachi's 1200 spindle drive, the 8598, is likely to be available in the West from at least one of the firms that sell its big processors. National Advanced Systems is likely to sell the drive and BASF also hopes to offer it.

Last year BASF announced that it intended to sell the AP and MP versions of the M200H as the 780AE and 780 MP. Earlier this month NAS announced its own IBM compatible version of the dual processor M200H as the AS9000 DPC for delivery at the end of 1981. It will come in both lightly and heavily coupled versions along with NAS added features like extended channels and main memory data streaming support and MVS/SP Asist. Olivetti Computers, the third vendor of the M200H in Europe, has yet to announce a dual processor.

## Olivetti new chief

OLIVETTI Computers, one of the three firms in Europe selling IBM compatible versions of Hitachi's large scale mainframes (see front page) has a new man in the managing director's seat at its Rome headquarters. He is Mario Pedretti, formerly director of marketing with the parent company and a one-time country sales manager for IBM Italy.

Pedretti replaces Lorenzo Bozio who is being retained by Olivetti Computers as a consultant, primarily to advise on how the company should handle its dealings with Hitachi in Japan.

Hitachi is known to be embarrassed by having three separate firms selling its big machines in Europe.

Olivetti Computers has not achieved the sales success with the Hitachi built machines that it originally hoped for.

## Legal technicality clears CSC

THE US government has lost the latest and possibly final round of its legal action against Computer Sciences Corp, CSC, in which it is charging the giant computer services firm and six of its employees with deliberately overcharging for its Infonet time sharing facilities. But they got off on a technicality.

In the US District Court at Alexandria, Virginia, Judge Richard Williams dismissed all charges against the company and five of the individual defendants on the basis that unauthorised people were present at the hearings of the Federal grand jury that brought the indictment.

Charges against a sixth defendant were dropped because the government failed to inform him that he was under investigation

when he appeared before the grand jury. In this way his constitutional rights were violated.

The charges against Computer Sciences were first levelled in October last year and led to a ban on the company bidding for any new government contracts, a serious blow because government work provides the firm with the majority of its revenues. Early this year the ban was lifted on bids for all new contracts except time sharing.

While existing Infonet business with the government brings in a substantial \$40 million or more, it is quite modest in comparison with Computer Sciences' contract work for US government departments which brought in a formidable \$243 million in the year ended March 28, 1980.

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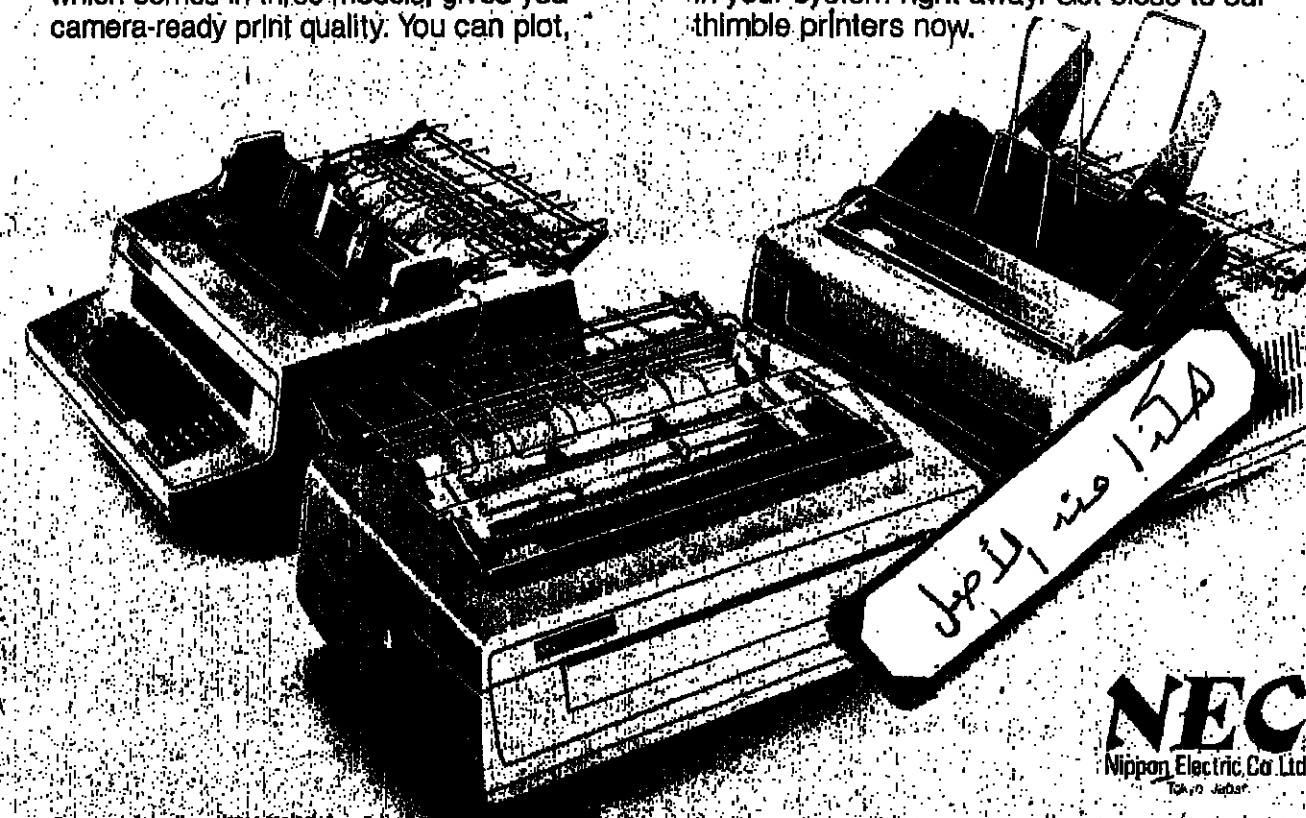
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NEC Communications Europe Co Ltd, NEC House, 100, Strand, London WC2R 0JH, UK. Tel: 01-388-8100, Telex: 261914



# Western Europe services market 'will catch up with the US by 1983' — report

by Keith Jones  
THE Western European market for computer services will be as big as that in the US by 1983. This is one of the main conclusions in the fourth annual European market survey\* published by the European Computing Services Association.

Prepared for ECSA by the London office of Quantum Science Corp., it gives \$7.1 million as the total 1979 expenditure on computing services in Western Europe, and an overall growth rate prediction of nearly 16% for 1979-1984. Batch services, which now account for more than 38% of all business, will grow by a relatively sluggish 8.9% a year but remote services will zoom ahead with an 18% growth rate.

Software development services will enjoy an average annual growth of 18.1% while sales of software products, no doubt encouraged by the desperate shortage of programmers for custom software development, will lead the field with an 18.9% growth.

Breaking down the market by

supplier, the survey reveals that IBM is still the largest services supplier in Europe.

French computer services companies account for 13 out of the 30 top suppliers of services in Europe and occupy five of the top ten positions. Only four UK firms make the top 30, and only five US-based companies. The survey explains that US suppliers dominate particular market sectors like time sharing services and system software products.

Competition from small business systems suppliers is identified by the study as one of the main problems experienced by services suppliers and it sees major growth opportunities for all services suppliers in the integration of hardware and software systems.

The expenditure on hardware for resale as part of complete systems was found to total \$600 million at end user prices in 1980. Total employment in the European services industry was 161,000 with France accounting for 34,500 and the UK 34,000. Employment in West Germany

was only 18,100.  
\*The Fourth Annual Survey of the Computing Services Industry in Europe 1980. Price to contributing members of ECSA, £45. To other ECSA members, £65. To members of other computing services associations, £130. Quantum Science Corp, 16 Charles II Street, London SW1Y 4QU. Tel: 01-839 5347.

## Japan eases restrictions

JAPANESE business for US computer services firms, in particular time sharing suppliers like Control Data, General Electric and Tymshare, should benefit from an easing of Japan's restrictions on the sale of US originated services.

Until now US firms have only been able to offer trans-Pacific services from one site in the US, restraining them to offering only about 10% of all the facilities they could make available. That limitation has now been removed.



Clive Sinclair with his pocket TV.

## Pocket TV for £50 by 1982

by Brandon Gamster  
CLIVE SINCLAIR (left) holds up the tube for his £50 miniature flat-screen TV. By the end of 1982, a new factory in Dundee will be geared to produce 1,000,000 sets a year. Production is planned to be increased through to 1985 when 1,000 people will be employed on the project.  
Tony Rind, general manager for Sinclair Research, told Computer Weekly that the TV should come out a completely new market in the same way as did the radio when it changed from being a household asset to a personal one when it became transistorised.  
The £1 million-plus invested in R&D to perfect the design of the cathode ray tube and the techniques for automating its production were shared between Sinclair Research and the National Research and Development Council. Sinclair's portion has been paid largely from profits on its Z80 £100 microcomputer which was launched 12 months ago and is currently being produced at a rate of 10,000 units a month, 70% of which are being exported.

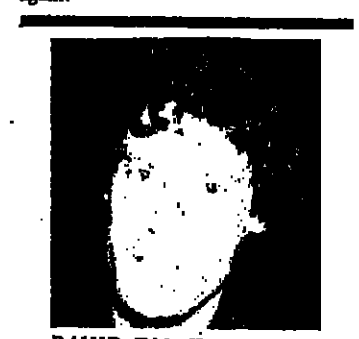
Rory Johnston reports on the remarkable results of a collaboration between man and machine in Pasadena

# Computer is 'leading the artist into new trains of thought'

THE debate goes on, in these columns and elsewhere, over whether computers can really create anything new.

The issue is particularly contentious in the field of art, where computers are being programmed to produce pictures, pieces of music, even books.

As the little computer-controlled cart trundles round the floor drawing squiggly lines with a felt pen, the onlookers argue endlessly over whether the resultant pattern is the creation of the programmer (in which case the computer did not produce anything) or is random (in which case it is not art) or is something else again.



DAVID EM: Fascinated by the nature of electronic light.

Into the midst of all this a breath of fresh air is being blown by a Californian artist who is producing paintings of startling originality using a computer purely and simply as a tool, a kind of Space Age canvas and palette. But, he insists, he would never have come up with the ideas in the pictures were it not for the computer, which provides new capabilities, stimulation, and even a strange power of its own to direct the way a picture is going.

David Em has the improbable job title of Artist-in-Residence at the Jet Propulsion Laboratory in Pasadena.

What need has a space research centre for a fine artist, ask we matter-of-fact British? Very little; but even the most down-to-earth American institutions tend to have a little voice in the back of their minds saying "We ought to do something about Culture and the Quality of Life."

The significance of JPL is that it is the place where pictures transmitted back from space probes to Saturn and beyond are received and processed, and for this work highly advanced colour graphics computer systems have been developed, providing much higher resolution than is normally available on a video screen.

It is here that David Em nicks himself in when he can find some free time on the computer, to produce original abstract paintings of extraordinary vividness and dreamlike, even hallucinatory, quality.

The equipment is a PDP-11/55 with a digitising tablet and a high-resolution colour screen. The software, written by James Blinn of the lab's technical staff, provides a choice of 256 colours and a range of "brushes" which vary the effect of the stylus on the tablet, from lines to fine "sprays".

Images that have been drawn into memory and thence on to the screen can be moved, copied, rotated, overlapped, and otherwise processed by a set of geometrical operations. The system is now fast enough to be interactive.

An especially novel part of the facilities is the way surface features and types of "space" can be generated, stored away, and added to pictures in progress. A database of textures has been compiled. The whole process of making a picture

can be one of trial and error, because an area filled in with one colour or texture can easily be changed to another automatically.

The finished pictures are best viewed on the video screen, which gives brilliant, almost vibrating images. Em describes himself as "fascinated" by the nature of electronic light. For wider dissemination, though, he is making 30-inch by 40-inch colour photographic prints, and hopes soon to be able to make them 10 feet long. He has also produced lithographs from the pictures.

The visions in Em's paintings can only be described as fantastic: he says himself, "They are imagery that could not exist in reality." People often tell him that the pictures remind them of things they have seen in their dreams. They tend to be curious mixtures of purely abstract and vaguely natural forms. Architectural features, valleys, rudimentary landscapes seem to be visible in many of the pictures, as Em himself points out. He remarks that, curiously, "It is forms found in Nature that the computer likes to deal with on its own most of all."

This raises the intriguing question of what it is that the computer is actually doing for the artist. Says Em, "It leads me to trains of thought that would never have occurred to me without the computer." Partly, he explains, the medium does tell him what to do, and it is possible for him not to know at the beginning where he will end up with a picture. But this was true of classical painters too, he points out.

The one thing of which Em is sure is that he could never exhaust the possibilities of his new medium. "I feel I have an infinite machine here," he says. His job is to work with the machine to seek and find new visions, new relationships between colours, new spaces. "The medium is only at the Neanderthal stage," he asserts.

Em got involved in producing art from technology when he was given a job as artist-in-residence at a small Southern California plastics company. The owner was interested in art and thought his moulding machines could be used for creative ends. Thus Em started out producing room-sized plastic sculptures.

This got him into an environment totally foreign to most solitary artists — he had to learn to organise helpers to operate the machines with him, and he had to learn to deal with the management. These continue to be sizeable preoccupations at JPL.

He is dependent on technical people because he has firmly resisted the temptation to learn the engineering skills involved in his art, for fear that he could easily dissipate all his energy just getting the equipment to work.

Too many artists he knows have learnt programming and now spend all their time writing software and never producing any pictures. Em is fortunate in having world class help in computer graphics among the JPL staff.

A major outside preoccupation of Em's is theatre: writing and directing multi-media productions in the host of ambitious small theatres that nestle around the film industry.

Em's pictures are used as scenery, projected from slides on to translucent screens around the set, and insect-like costumes, also designed by Em, combine to produce plays like nothing that has been seen before.

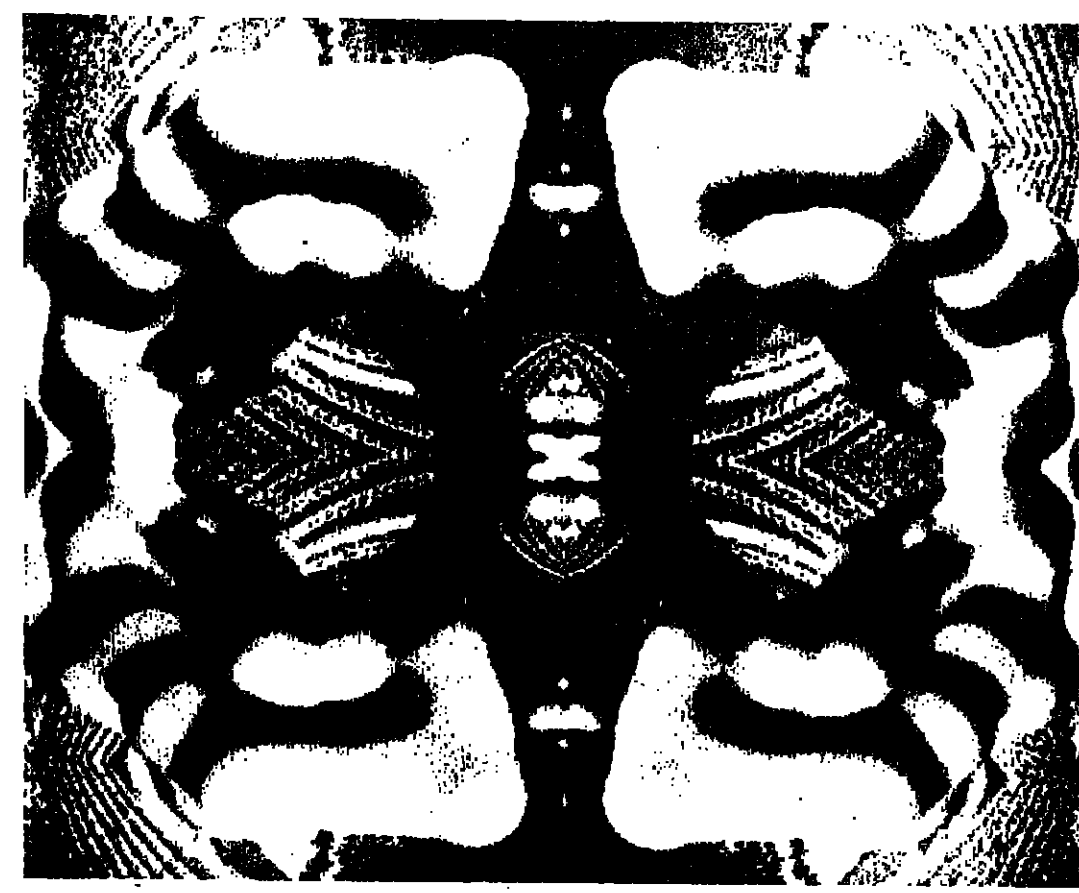
Online projection of graphics using a television projector is the

next logical step for Em's theatre work, opening up fascinating possibilities of modifying the visual effects in accordance with the action on the stage.

Em's ultimate goal now is to make a film. This is difficult at the moment because of the huge amount of processing that has to go into each picture, and therefore each frame of the film — the project would take a very long time.

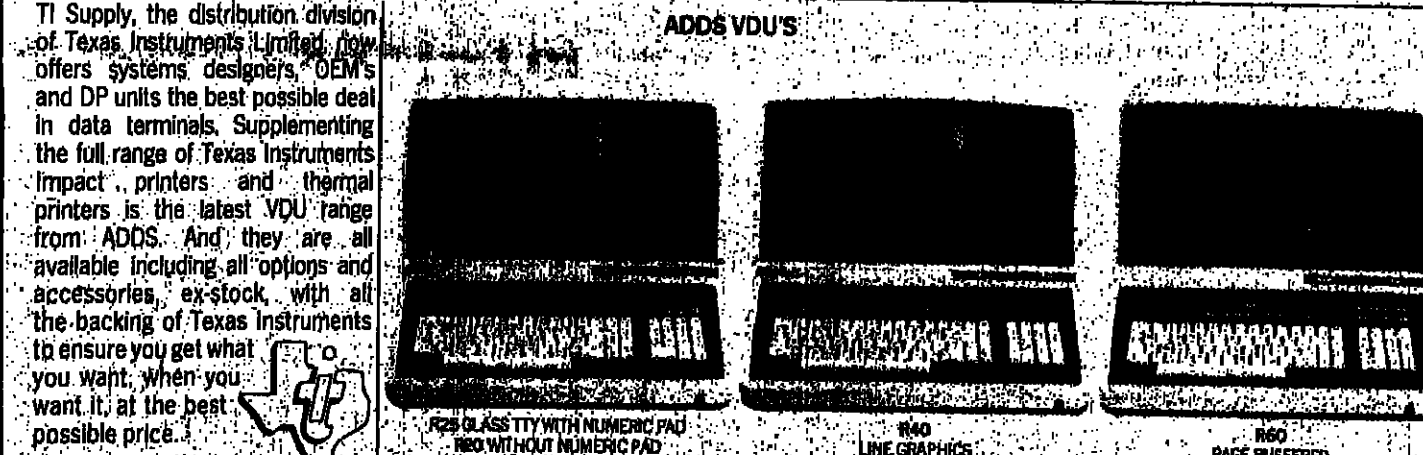
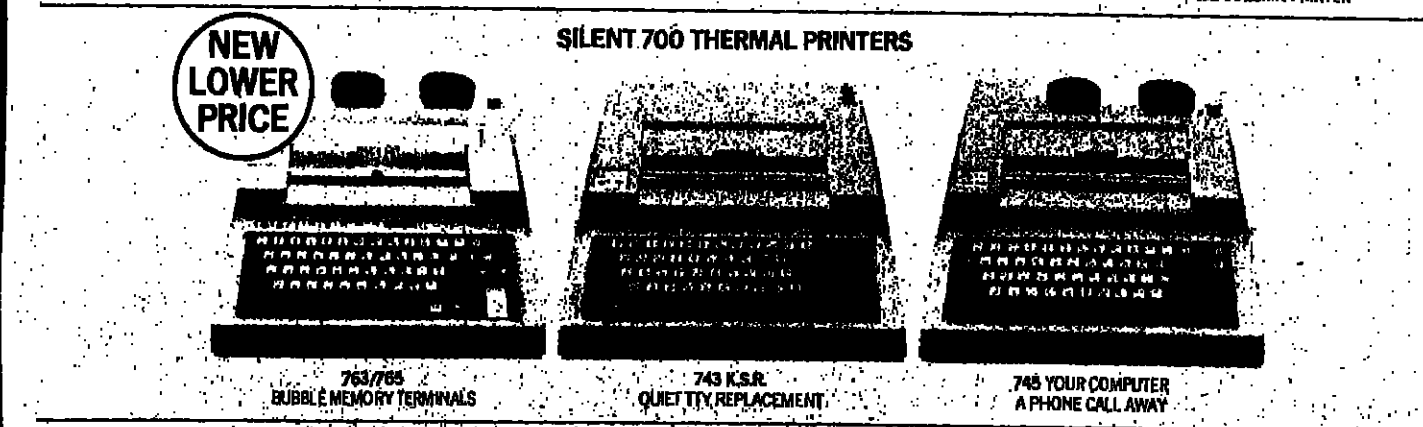
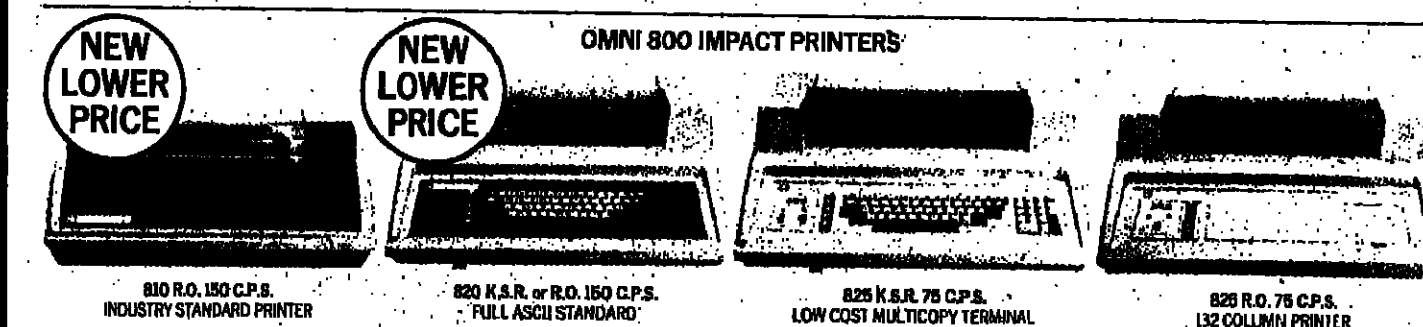
However, plenty of work is already going on in the field of digital animation, especially at the New York Institute of Technology, and the physical constraints may soon change. Em even foresees a computer producing sculpture, given appropriate digitally controlled tools.

Maybe the days of the artist in the garret are numbered, now, all over the world.



David Em's picture MUMU2 was produced at the Jet Propulsion Laboratory with software by James Blinn.

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\*Please note applications for tickets cannot be accepted after February 23, although tickets will be available at the door price £1.50. Cheques should be made payable to IPC, sterling to IPC Business Press Limited.

## London Polys order 200 VDUs from Data Type

AT least one firm in depression-hit South Wales is doing well. Data Type Terminals of Cwmbran is to supply four of the five Inner London Polytechnics with 200 of its DT2 and DT22 VDUs. Data Type has also been awarded a three-year inflation-proof contract to service 650 terminals used by the London Polys.

The VDU order includes 20 units equipped with a graphics option developed and manufactured by Data Type itself.

The four Polys are City Polytechnic, North London Polytechnic, the Polytechnic of the South Bank and the Polytechnic of Central London. Each runs a Digital Equipment DECsystem 10 mainframe, Central London also being served by a DEC VAX-11/780.

The Data Type DT2 provides a 12 x 10 dot matrix character resolution and its keyboard includes a numeric pad. The DT22 also offers 11 special function keys which can be preset to increase flexibility.

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## £60,000 software boost for Xoren

by David Casey  
UNDER the National Computing Centre's software products support scheme, £60,000 has been made available to Xoren Computing to aid development of its IPL-11 Interprocessor Link package.

Designed as a low-cost data transfer package between two DEC computers — either of which may be a PDP-11, LSI-11 or VAX-11 machine — IPL-11 is available currently for four DEC operating systems.

Software versions have been released for RSX-11M, IAS, VAX/VMS and RT-11, and Xoren plans to launch an RSTS-E alternative later this year.

In common with many other software tools, the IPL-11 package was developed initially to meet a specific data handling requirement. As part of a software development contract Xoren needed to transfer programs and data from its own RK05 discs to the RL01 packs used by a client.

Establishing a modem or acoustic coupler link between the two computers was only part of the solution, however. Error-free data transmission would be essential if the IPL-11 packages were to be viable commercially.

Incompatibility of the DEC operating systems added a third dimension to Xoren's problems: to make any impression on the 100,000-strong UK user-base for PDP-11s, the package would have to transfer data between different operating systems and sharply contrasting file structures.

IPL-11 package specification has succeeded in scaling the obstacles and the system can full error-checking capabilities. CCITT recommendation V42, transmitting data blocks.

If a telephone link had to be established after a complete breakdown on the line IPL-11 would continue transmission from the last block read over the circuit correctly.

Xoren claims a significant benefit for IPL-11 over other data communications packages. Earlier attempts at transferring files between two computers had closed off both machines while files were being sent down the line.

Under the Xoren IPL-11 system, other jobs or tasks are permitted to run and each computer terminal is freed immediately the software link is established.

The effect is to produce a package which can merge into the computer's operating system in a way which makes it transparent to other programs running at the same time.

While two machines may be linked directly, the IPL-11 package was also designed to handle asynchronous traffic.

By launching the package at £540 for each of the two five-year licences needed to link a pair of PDP-11s, Xoren manages director John Jarvis sees a major market among DEC OEM distributors who need to communicate with their own clients.

## France close on US heels

FRANCE's electronics equipment industry reports a 28.2% increase in turnover for last year, with a total of 16.3 billion francs, of which over half represented exports.

The industry, with a payroll of 50,000, now ranks as the world's second biggest, just behind the United States.

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Bouderville said that the French military establishment provided 64% of orders last year. But this source of prosperity was likely to diminish over the next few years.

The electronics industry federation's chairman warned that the French state's share of investment was now 38% compared with 35% a year or two ago.

## BEE lives again

THIS first staging of the new Business Efficiency Exhibition is to be held next year at Earl's Court, London, from June 14 to 16. The old BEE was absorbed into the International Business Show in 1977, and moved from London to the NEC in Birmingham.

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# Helping to lock the door against CP/M bootleggers ...

AN aid to protect software running on the CP/M operating system has been developed by a Gloucester-based company, which is now making it available to other CP/M authors.

Atec Computer Services is a bureau based in Blakeney, which specialises in auto test equipment. Four or five years ago Atec developed a new language, called Royal, which although recognised as something of a breakthrough in its own field, won the company hardly any revenue outside the UK because of bootlegged copies circulated among US users, estimated at 200-300 strong.

Determined not to get caught out again, Atec's Roger Prout wrote a safety harness for the software which had been developed as part of the bureau's move towards a mini/micro set-up.

The product, which goes by the in-house name of Code, is a two-part tool which prevents the copying of programs under the

CP/M PIP command. Effectively, it fixes the program to a physical part of the disc, and although it can be copied, the copy will be a garbled version which will not work.

Each program calls a small subroutine of code which gives access to the program through a password. A separate standalone utility creates characters on the disc which gear the file to the physical disc and make it impossible to copy without the authorised password.

"Bootlegging really is a problem for us, so to protect our software we looked into the operating system itself as a way of preventing unauthorised copying," explained Roy Coldrick of Atec. "It's by no means a panacea as anyone who knows anything about the problem of bootlegging will recognise - it's just not possible to protect totally against the copy mechanism."

"This probably won't deter the

determined hobbyist, but what we're aiming to do is cut out the kind of copying which takes place among small business end-users, who wouldn't know about sector-to-sector copying which this can't prevent.

"What we want to protect against is the PIP file-to-file copying mechanism, where the biggest problem is. Take Microsoft's Basic - I'd like to know how many copies have actually been bought and how many copied. I know of a dozen in this area alone, and this isn't exactly a hotbed of computing."

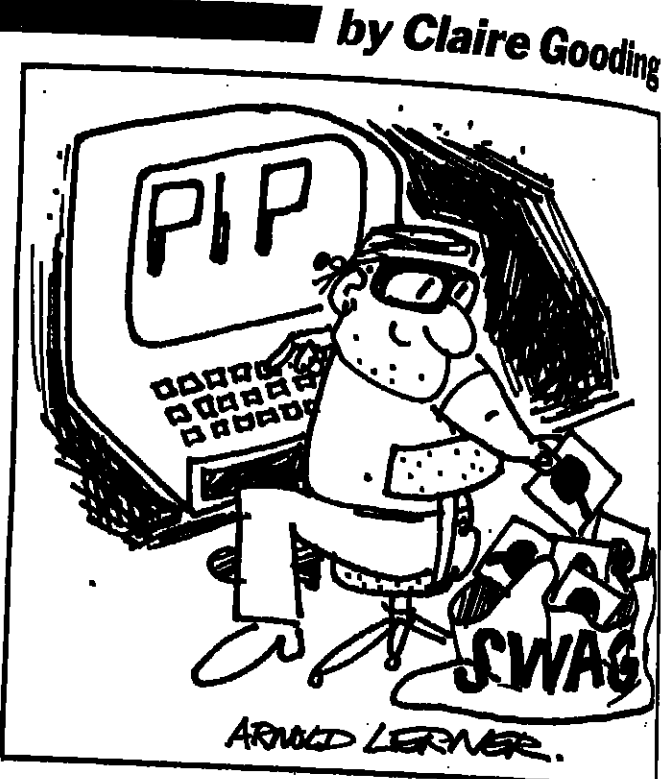
"I'm almost a bit embarrassed to go overboard about the product as we are relative novices on CP/M, although we do have a lot of experience elsewhere in electronics as well as mini- and mainframe operations. I think possibly we happened to notice a quirk of CP/M that we could use."

"One or two people have said

that at £300 it's far too expensive, but my answer to that is that it could pay for itself by preventing just one or two bootlegged copies of a product. It's really a spin-off for us from our own software development, so we haven't given a great deal of thought to marketing it as yet."

The Code tool itself cannot be copied. Many people in the micro-software business, which is the prime area where sales suffer from bootlegging, feel that physical and technical deterrents are the answer. The most stringent of laws (and Britain hasn't even a clear policy as yet) will not deter the most determined of thieves.

Given the present hiatus in establishing copyright on software, those who spend time and money developing applications for such popular systems as CP/M are wide open to piracy: perhaps such products as Atec's go some way towards locking the door.



## ... and other pirates

THE romantic image of pirates should be shattered by the gathering of software industry pundits who are to pool their wisdom on the copyright and piracy issue.

The conference on Computer

Software Protection is taking place at the Waldorf Hotel, London, on March 3, and is organised by Gower Conference. The well-known experts Peter Laurie, Alastair Kelman and Julian Allason are among the speakers.

by Claire Gooding

John Williamson reports on some controversial questions raised at the Mecom 81 exposition in Bahrain this month

# Arab world takes a dusty view of 'so much information'

AT a time when we are assured from every public rostrum that the Information Age is just around the corner, the rarest of creatures is the man who openly casts doubt on the basis and value of what has come to be called telematics. One such surfaced in the Middle East earlier this month.

Dr Tawfeeq A. Almoayed was again the conference chairman of the Mecom 81 exposition in Bahrain. In his opening address, reviewing communication developments in the Arab world since the previous Mecom event two years ago, Dr Almoayed was guarded with the progress made towards indigenous control and maintenance of equipment, but commented: "However, we can still question many aspects of the present scene, in particular the vast growth in high speed data handling techniques which seems to have no clear objective but to find a use for all the silicon chips being churned out worldwide."

"A new jargon word, telematics, has even been coined for this combination of telecommunications and information, perhaps to insulate our minds from the reality of the situation. And what is the reality? What are we supposed to do with so much information?"

In certain parts of the world - and one naturally thinks of France - such questions are little short of heresy. Indeed, Dr Almoayed's words were greeted with some

vice (both fairly novel for the area). These, and good national and international telecommunication links, have been instrumental in attracting well over 50 offshore banking operations to the island.

Other countries in the region are also looking to establish fairly sophisticated data networks. Iraq, for example, is known to have plans for a public data transmission network. Few details have been made public, but it seems likely that the first phase will be the establishment of a small network related to a particular application. This will be expanded, in more general use, to cover Baghdad and then other major centres like Basrah in the south and Mogul in the north. The Spanish PTT, Compañia Telefónica Nacional de España is one of the bodies known to have had official contact with the Iraqis.

In Saudi Arabia, too, both point-to-point and multidrop data networks are receiving serious attention. Some, like those for the Saudi Ministry of the Interior, and the Saudi American Bank, are currently being implemented.

Dr Almoayed's other main thrust in his opening address was the discrepancy between talk of transferring communications technology to the developing world and the actual implementation of this. The developed world was castigated for sitting around wondering how to share out the crumbs while keeping the main course for themselves.

The Mecom 81 exhibition provided a showcase for the products and services of some 120 companies and organisations, with the UK and US fielding over half of these. Over 3,500 visitors were recorded at the turnstiles.

As one would expect, the majority of exhibition space was given over to what might be termed first level communications equipment - terminals, switching, transmission equipment and outside plant for voice communications and elementary data systems like telex. This was also the case with Mecom 79. However, in the intervening 24 months a demand for more mature forms of data processing and communication has clearly sprung up in the Gulf area to be reflected in some of the exhibits at this year's exhibition.

The requirement for facsimile transmitters - exhibited in 1981 in actual or graphic form by Muirhead, NEC, the French PTT, Rapidcom etc. - is not surprising, bearing in mind the difficulty of committing Arabic script to conventional telex. According to a Muirhead spokesman, the Middle East currently represents the world's fourth largest market for this type of equipment.

Word processing and electronic mail systems are not so obviously requirements of the region, but business is apparently booming. DHL, a division of a company which started out using couriers to transport documents around the world, now has over 50 installations around the Gulf. The DHL 1000 machine, which has an RS232 communications interface, is shortly to be made simpler to use and more comprehensive in capabilities with a new software package.

National Computer Services, a Bahrain-based company which distributes Vydex word processors, also reported a buoyant market. But an NCS spokeswoman pointed out that IBM is not pushing word processors in the Gulf and, unlike in some other parts of the world, has not gone in first to

perform its customary educational service.

Mecom 81 was not an event at which much new equipment saw the light of day. One exception was AEG-Telefunken's data encryption equipment, Telecrypt-DAT 813, shown in Bahrain linking two Dacom facsimile transceivers modified by Kalle. DAT 813 is one of the first devices of its kind to offer full duplex working with a V24 interface. Its manufacturers claim that, with digital techniques and pseudo-random number generators, it will take 100 million mainframes working flat-out for 158 million years to cover 50% of the equipment's possible permutations.

Mecom 81 organisers, Arabian Exhibition Management, professed huge satisfaction with the way things had gone.



British Telecom staff (the consultancy arm of British Telecom) are now working in the Middle East, helping to expand technology in the area.

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## Magnuson 'go-faster' enhancement for MVS

DOGGING IBM's footsteps, Magnuson Computer Systems has announced its own microcode "go-faster" enhancement for users of IBM's MVS operating system, promising a 17 per cent performance improvement on Magnuson hardware.

The product, called MVS Extended Facilities, uses IBM's own Systems Extension and Systems Product software. For Magnuson it means not just speedier performance but the chance to attract into its midfield market large MVS shops wanting to expand.

"The enhancement allows a low-cost Magnuson 80 system to be added to MVS installations running offload applications and systems development work," explained systems manager for Magnuson UK, John Rickard.

The Magnuson M80 is compatible with IBM 360, 370, 303X and 4300 series machines. "What we're really doing is emulating IBM instruction sets," said technical director Howard Dowling.

"If you look at most medium-sized plus compatible machines they haven't yet offered microcode to run large operating systems."

"We now have the advantage of being able to put in a Magnuson to use with main storage in a shop running MVS/SE, to use the same level of OS. That means both machines use the same OS; only one lot of fixes or updates to set."

The product was developed by Magnuson's San Jose headquarters by a small team of microcode specialists, who work to emulate IBM announcements, "usually within 60 days". It has already been benchmark tested at Roco (Haseo) in Houston.

On the smaller machines, M80/31, 32, and model 4, it can be purchased for £3,500, or rented leased. On the larger range, M80/42, 43 and 44 it will be supplied as a standard feature.

For those who missed the BBC's highly praised introduction to the world of data processing and database techniques, the series is coming round again on the Open University syllabus.

The course is aimed at those who already have a basic understanding of computers and computing, but want to appreciate the aims and uses of databases. "Most of it has been shot on the shop floor," explained executive producer of mathematics John Richmond. "We look at how things are physically stored in warehouses, and how a picture is built from various procedures, then how it is reflected in the data structures used by the computer."

Reviewing the series in the

Times Educational Supplement last year, Professor John Florentin described it as "the stuff of real computing... it could be useful in many courses outside the Open University, to introduce students at levels from the sixth form upward to the world of real computing."

The programs can be recorded off-air for a copyright fee of £1 each, hired, or bought direct from the OU. They are due for transmission monthly on BBC2, roughly every fourth week on Sundays at 10.10 am and Fridays at 7.30 am.

Details are available from John Richmond at BBC Open University, Alexander Palace, Wood Green, London N22 4AZ.

## Test package

THE NCC is co-operating with the Southampton-based systems house Gresham Computer Services in producing a testing package for ICL VME-level 29004 which will enable users to remove errors in logic, syntax and data before running programs online.

The testing package is the first part of a £15,000 NCC/Gresham joint project based on Gresham's ICL 29004 teleprocessing monitor, and is the first project in the Software Products Scheme to concentrate on ICL-compatible products.

The results of a survey conducted by the US Unix user group, UNIX GROUP, are now available from the Santa Cruz Operation, 500 Chestnut Street, Santa Cruz, California 95060.

The survey concentrates on the adequacy and importance of features, applications and software in Unix with other information on current and planned uses of the system among the 63 respondents. The report costs \$75 for a full analysis, and \$15 for survey results alone.

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With regard to other forms of data processing and communication, Dr Almoayed was more at ease, as well he might be. After all, Bahrain's main aspiration is to become the banking and business service centre for the Gulf area and a priority requirement for this is the existence of a range of sophisticated voice and record communications services.

Great strides forward have already been made. Cable and Wireless, which operates Bahrain's telecommunications system, provides a database access service and a custom user message switching ser-



Dr Tawfeeq Almoayed, the Mecom 81 conference chairman. "We can still question many aspects of the present scene."

rather uneasy fidgeting in his immediate audience since outside in the Mecom 81 exhibition, French manufacturers and PTT were mounting their usual telematic extravaganzas, and British Telecom was once more extolling Prestel.

In the context of the Middle East, Dr Almoayed may well have a point. He continued: "Much of it is obviously aimed at the widest consumer market through the medium of domestic television and the telephone network. The worst part of it all is that so much effort is given to such sophisticated data retrieval systems whilst ignoring the most basic needs of the community. Public telephone networks are, it seems, treated as a 'quick-fix' something that exists to provide funds for such grandiose schemes."

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## Poland will phase out the import of Western computers

by Bohdan O. Szuprowicz

RECENT developments in the Polish data processing industry suggest that there is little chance of Poland becoming an expanding market for Western hardware. Regardless of changes in East-West trade policies, ICL, IBM and CDC will all lose their market shares in coming years.

Reporting on recent deliberations of Poland's Committee on Science and Technology of Informatics, the magazine Informatyka points out the need to limit Poland's computer hardware production and imports. This decision is dictated primarily by the necessity to slow down capital investment within the Polish economy and reduce the outflow of hard currencies. Poland owes over \$20 billion to Western bankers and between 60% and 70% of Poland's export earnings are already committed to servicing that debt.

In these circumstances, imports of Western hardware have been reduced to a trickle and old computers imported from the West since 1965 are being replaced by domestic machines, or at best by imports of Rind computers from Soviet bloc countries.

At the end of 1980, there were 715 general purpose computers in Poland, not counting a much larger number of minicomputers mostly supplied by domestic production. Of this total, only 33 computers represented imports from the West while 71 were machines imported from other Soviet bloc countries, mostly the Soviet Union and Czechoslovakia. Western imports in 1980 were already down from 42 machines that existed in Poland in 1979 after some old ICL, IBM, and CDC computers had been phased out. No new sales of such machines have been made to Poland in recent years.

The 1980-1985 general purpose computer deployment plan for

Poland indicates that the number of such machines is expected to increase to a peak of 744 computers in 1982. After that, the plan envisages a quick decline to only 545 medium-size general purpose machines by 1985, while minicomputer production and installations are to increase rapidly. As a result, questions are being raised as to whether Poland should even continue to manufacture medium-size general purpose computers. Some believe that the country may be better off in the long run concentrating on production of minicomputers, microprocessors, and certain peripherals with export potential.

This new plan means that by 1985, imported general purpose computers will constitute only 8.8% of all such machines in Poland, down from 14.5% in 1980. Western imports, which represented only 4.6% of the total inventory in 1980 will drop to a meagre 1.8% by 1985. Soviet bloc imports will also decline from almost 10% in 1980 to only 7% in 1985, but some Soviet minicomputer models are being produced under licence in Poland alongside the domestic Mera 400 series minicomputers.

Among major Western manufacturers likely to lose their market shares in Poland are IBM, ICL, and CDC. By 1985, only 10 Western general purpose machines are scheduled to remain in Poland if such Western computer is exported for the typical 10-year depreciation period practised by Polish end-users. These Western remnants are expected to include an ICL 2903, two IBM 370/148s, two CDC Cyber 73-16s, a Univac Singer S-10 systems, all of which are already rapidly becoming obsolete. This is a far cry from 1979 when there was a total of 42 Western computers in Poland including 15 ICL, 13 IBM, and five CDC machines.

## ITT threat to shut in France

by Jack Gee

ITT has warned the French government that it will shut down operations in France unless the president, Valéry Giscard d'Estaing, gives orders to stop discrimination in handing out major telephone orders.

After waiting impatiently for the French post office's telecommunications management to select its System 12 telephone exchange, ITT is shutting down 700 jobs in its last surviving French subsidiary, Compagnie Generale de Constructions Telephoniques.

CGCT, which has a payroll of 750 and four French factories, is likely to be sold if the System 12 order does not materialise within the next few months, according to ITT's European president, H. John Gulliford.

ITT complains that the French government has deliberately been favouring Thomson-CSF, CIT-Alcatel, SAT and Matra in placing big electronic contracts.



PRESIDENT GISCARD

"It would be a scandal," The US firm considers this a breach of promise by Giscard, whose officials persuaded ITT in 1976 to sell two of its three French

subsidiaries to Thomson-CSF. In return, ITT received handsome cash payment and a promise that CGT, the last remaining subsidiary, would retain a 10% share of post office orders for electronic phone exchanges.

The post office's telecommunications management claimed the ITT is trying to pressure the French authorities. But ITT points out that only a few weeks ago it was excluded from post office orders for optical cables in Biarritz and Le Mans.

Thomson-CSF recently announced plans to reduce staff by 5,000 before 1983 as electronic phone orders shrink on the French market. This is embarrassing for French Premier Raymond Barre who announced there would be no job cuts in the French phone industry.

President Giscard also said publicly: "It would be a scandal if people were dismissed from France's telephone industry."

## Soviet 'harassment' is discounted

by Kevin Cahill

FOLLOWING widespread reports that American companies operating in Moscow have been subject to harassment, IBM has stated that it has noticed nothing unusual.

The reports also allege that Russian capital have had direct telephone calls to the Olympics removed. The reports

have been replaced by old operator connected machines. The Russian authorities claim that the direct dial phones were experimental.

IBM agrees that it has received a letter from the Soviet authorities recently but claims that the form is the same as those delivered in previous years.

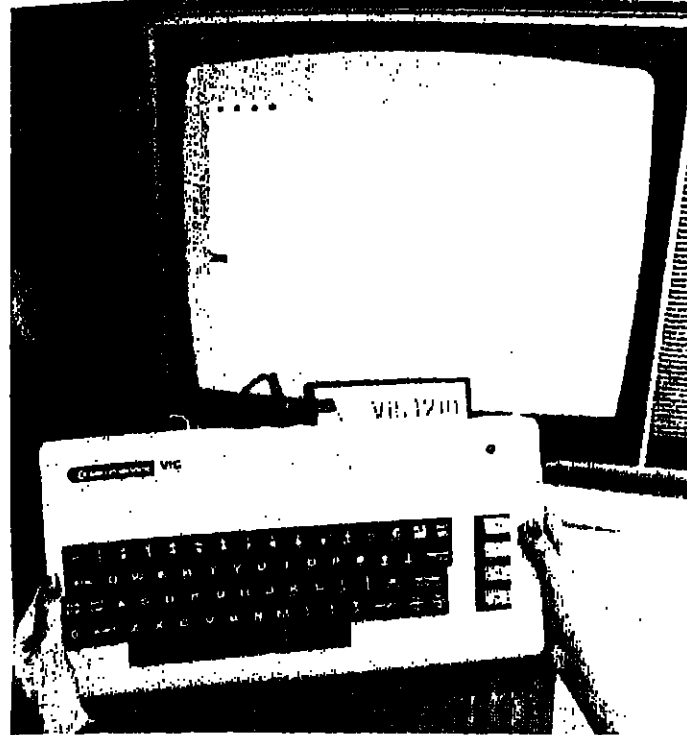
Other US companies continue to request for more information than

required previously.

The reports began to circulate a few weeks ago and according to US sources the likely objective of the exercise is to obtain an agreement which would exempt American-based Soviet companies from Aeroflot from US rules.

This would be in return for exempting companies such as ITT from the 40% profit tax imposed by the Soviet Union.

## MICRO NEWS



Commodore's entry in the lower end of the personal computer market is marked with the introduction of the VIC 20 (video interface computer). The VIC is expected to be available at Easter for under £200. Based on the 6502 eight-bit microprocessor from MOS Technology, a Commodore subsidiary, the VIC 20 has 5K of RAM expandable to 32K, 12K of Pet Basic ROM, a single I/O port and can operate with a 20-column screen.

## Japanese invade US market

by Hesh Wiener, Technology News of America

JAPANESE companies have done well in the US, selling consumer products like cameras, televisions, hi-fi systems and video cassette recorders. Now, companies such as Hitachi, Nippon Electric (NEC), and Sharp are introducing their microcomputers on the US market.

Sharp's handheld computer has been sold by Radio Shack (Tandy) for about six months, and several other companies, including NEC, Sony, Matsushita (Panasonic), Casio, Hitachi, Sord Computer Systems, Cannon, Logic Systems International and AI Electronics, are ready with their systems.

John McPhee, who observes the US computer scene for the Science and Electronics Division of the US Commerce Department, says: "The problems the Japanese vendors will face are the same problems the US companies already face: those of distribution, service and software."

McPhee expects the Japanese companies to deal with distribution problems by using either their established networks (if, like Panasonic, Sony and others, they now have them) or by fostering relations with business equipment and computer retail stores, particularly those with locations in more than one city.

He thinks the Japanese companies will deal with service problems by producing machines that rarely break down. The reliability of Japanese products has already been demonstrated in medium-priced hi-fi systems and cameras. But computers also need software.

"Traditionally," says Mr. Phee, "the Japanese lag behind the US in software. This tradition will not

last. But good custom software is a problem, even for US vendors."

To some extent, software problems could be solved by US companies. The Japanese may choose to sell their computers to OEMs who will, in turn, use their sales expertise to push the Japanese products in the US, developing or adapting software along the way. Later, the Japanese vendors can come out with newer products, sold under their own names. For example, Sharp is building on the foundation laid down by Radio Shack. Some time this year, it will announce new systems of its own, to be sold by its own dealers.

"There must be a lot of US firms just itching to get into the home and business microcomputer markets," McPhee says. "And they would be happy to sell Japanese micros."

Another approach might be for the companies to develop easy-to-use systems that would attract more first-time users than do conventional approaches. "As new technologies creep in, you see a decline in memory prices," says McPhee. "Then you can squeeze more sophisticated software in, making the machines easier to use."

Some industry participants fear that once the Japanese companies make their presence felt in the US microcomputer market, there may be a reaction in the form of US protectionism. Tom Nugent, Panasonic's US sales manager for its portable "data" systems division, says: "As the market grows, there will be a build-up, followed by a shake-out. Finally you can expect the emergence of a few companies that will control the market."

He is quick to add, "But any problems are a long way off."

## Speech synthesis chip

A 32-WORD speech synthesis chip is now available from ITT Semiconductors. The N channel silicon gate MOS device which is mask programmable for different languages and vocabularies, marks the company's renewed efforts in the speech synthesis market.

Designated the UAA1103, the chip is suitable for control by microprocessor as its addressing is carried out using 3-bit binary code. Storage and processing of the speech elements is digital, including methods of data reduction

and removing redundancy. ITT's competitors in the speech synthesis field include National Semiconductor, which is also using the data reduction and digitising methods, Texas Instruments and General Instruments.

The latter two companies both use a linear predictive coding method whereby a mathematical model is made of the vocal tract. GI also uses a phoneme method which involves separating the speech into basic sounds, called phonemes.

## Shortage of test engineering staff unless work is automated

HALF the cost of a microcomputer system goes into testing and other related work, and unless it can be automated in the near future there will be a tremendous need for skilled test engineering staff.

This point was made by Dr R. G. Benners, of Cirrus Computers, at the latest meeting of the British Computer Society, in London. Addressing the Microprocessor Specialist Group, Dr Benners spoke on the testing of bus-structured boards.

Producing test programs for bus structured boards and then debugging them led to all sorts of problems for the engineer. It required a high level of skill including that of a hardware or systems designer, and of a software writer.

Dr Benners stressed that test engineers should not be thought of as failed designers. Their pay, unjustly, was often less than that of a design engineer, said Dr Benners. He discussed the test under three headings: test program generation, evaluating the test

program, and actually diagnosing a fault on a board. These tasks were complicated by various factors.

Often, incomplete or incorrect data sheets were supplied by the manufacturer and differences existed between components from the original manufacturer and those from second sources. Sometimes, there was lack of access to all the components on a board. Other factors included the sheer volume of test data needed and the variety and rate of change of the devices.

Debugging was complicated by the fact that it was difficult to simulate the faults. Documentation indicated all valid states of a chip but not always all the invalid states.

In fault finding, problems were caused by the tester not always being in control of what was happening on the board.

Tests could not always be done at actual run time speeds and the tester might have access only to the bus and not the actual components.

## Texas' 16-bit device available shortly

TEXAS Instruments' new 16-bit microprocessor, the TMS9995, will be available in the second quarter of this year at a cost of £23 for quantities of 100 or more. The chip, first announced six months ago, has an enhanced architecture but is still part of the 9900 family.

Designed and developed at TI's Bedford base, the 9995 differs from the rest of the family by its on-board RAM. It has 256 bytes of on-chip RAM which, with TI's method of using RAM as flexible working registers, greatly enhances the speed of the device.

An evaluation module based on the 9995 will be introduced at the end of next month at a cost of about £395.

The board contains a monitor for program assembly, editing and execution. Hardware features include two

EIA data communications links for interfacing with a local terminal and a host system.

Called the TMAM6095, the board provides 1K-byte of external RAM, and 6K-bytes of EPROM standard, which is expandable to 24K-bytes.

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# Cloud hangs over the Wall Street computer stocks

THE 80-go computer stocks of last year's American bull market in high technology shares are now beginning to "come off," as the brokers put it. The reasons are not hard to find, as Americans begin to take stock of their new President, and the inflation-ridden recession-hi economy he inherited.

Chairmen reporting on the current quarter's trading, often in the same speech in which they reveal last year's record turnover and profit increases (with some notable exceptions such as Burroughs and Memorex) have reported difficult trading conditions.

There were hopes late last year that the American economy was beginning to move out of recession, and President Reagan has taken the first of his promised steps to cut federal spending.

But very few economists believe that the turn has taken place. All the signs are that the cure which Reagan intends to apply will, as a very similar cure has done here in the UK, turn a recession into a full-blown slump.

Stockbroker firm Hesaltine Moss, in its February newsletter,

says: "High interest rates lead to high sterling (foreign demand), lead to industrial slump (due to recession at home and exporting uncompetitiveness), lead to high unemployment, lead to high public sector borrowing requirements (social security costs and low tax revenue), lead to high interest rates due to the need to sell gilts (government debt)."

The US is in the same vicious spiral, with both inflation and interest rates at far higher levels than in the UK. Currently American bank rate is 19% and inflation is at about the same level. Reagan administration sees Federal spending as the prime culprit, and the massive \$50 billion cuts the President wants will inevitably lead to a slowdown in orders to companies from federal procurement agencies.

In another part of its newsletter Hesaltine Moss points out the need for the UK government to distinguish between revenue and capital expenditure and to continue with capital expenditure.

If that advice had been taken earlier, ICL might have retained

the replacement policy for the ageing government 1900 machines, and possibly would have avoided some of its current troubles.

In the US, the new pessimism is the only possible explanation for the sudden fall in the shares of Prime Computers, which last week reported a record 84% rise in profit.

According to reports from New York, a number of big holders of Prime stock sold on the basis of a single phrase in the Prime president's report referring to "some order softness" in the current quarter.

Apparently that phrase, along with the general pessimism, was enough to set the shares back 20%, from just over \$34 to \$28 at one point.

However, that fall must be seen in the light of Prime's share price rise last year, which took the stock from \$14 to \$34 in a few months. Anyone who bought early last year will still be showing 100% profit.

Apple fell back last week from a high of \$37 to just over the original offer price of \$28. This fall may have nothing to do with the events

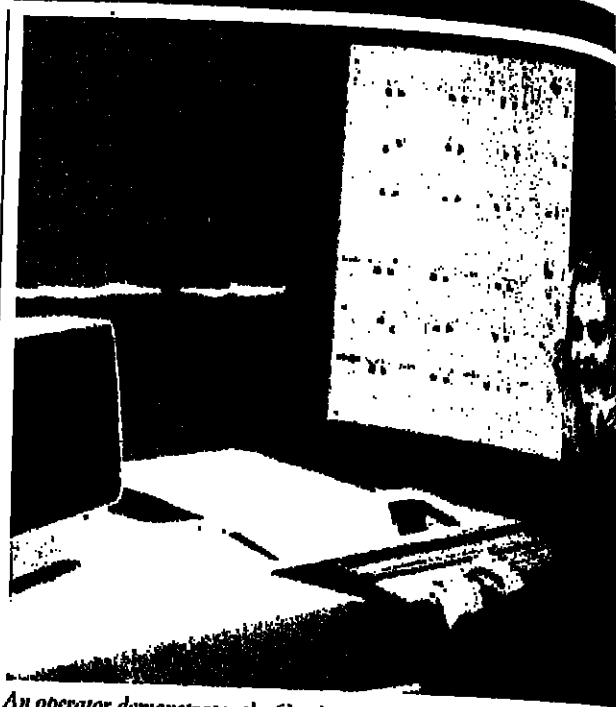
affecting Prime and other shares - it could simply be that some form of rationality is entering the investors' minds as they begin to meditate on the likelihood of a share ever being worth over 200 times the last known earnings of the parent company.

There is also the fact that a number of commentators are beginning to wonder whether Apple can sustain the remarkable growth it has shown so far. The Apple microcomputer, on the back of which the company has founded its fortune, is less technologically advanced than properly priced and packaged for its market.

The Apple's basic components were around before Apple assembled them, and they have been getting cheaper ever since.

And even that ubiquitous giant IBM has recently reported on the effective slash in its share value, while shyly borrowing billions on the side. Apple, like IBM, may begin to need expensive capital if it is to maintain the breakneck pace of its own development.

The share value on the facing page gives a good guide to the general US drift into gloom.



An operator demonstrates the Gordon and Gotch real time stockholding system at the company's City offices.

## Major coup for City payroll system

GORDON and Gotch Computers, the data processing subsidiary of London trading group (Gordon and Gotch), has announced a major coup for its batch payroll system. Merrill Lynch, one of the biggest finance houses in the US, and said to be the largest computer user there, after the US government, has signed to run the UK payroll with Gordon and Gotch.

This addition brings to 40,000 the number of payroll slips being handled by Gordon and Gotch each week and month.

The results for last year, in the Gordon and Gotch holding company accounts, show that the computer companies in the group had turnover of £2,319,000 and a profit of £310,000. This is a 13.3% return on turnover, and makes the computer bureau the most profitable subsidiary in the group, which had total turnover of £30.9 million and a profit of £1.2 million.

The Gordon and Gotch bureau business has been expanding re-

cently, and the new computer centre at Staines in Middlesex contributing to what the company hopes will be a record year.

The parent company now money into the computer side of last year, with a £1 million investment in dual Burroughs B220 sited in the City offices.

The dual running 4000 aimed at giving guaranteed back up to the specialised stockbroking service run by London and Gotch. This unit which now handles 15% of all share bargain transactions out by brokers on the London Stock Exchange, accounts for 10% of the bureau's turnover. Only four such packages are in the service is offered by Gordon and Gotch either on an in-house system, or via the bureau's service from Burroughs.

The majority of Gordon and Gotch's customers use the bureau's service from Burroughs, which equipment is sited in the City offices.

## Computas sees a big future in teleinformatics

COMPUTAS, the Norwegian software house, which has offices in London, reports turnover up 23%, to £6 million for the financial year just ended. Profit before depreciation was £600,000.

The company, which claims to be the biggest software operation in Norway, now has a staff of more than 200, and has additional international offices in Paris, Hamburg and Rotterdam.

Last year Computas started a subsidiary company in Sweden which the Computas managing director, Per Boman, reckons will be doing £1 million worth of business by the year end.

Boman says he expects to employ over 40 people in Sweden, to cope with this expansion.

Computas has developed a particularly strong position in the supply of software for technical applications in the engineering industry. The company produces packages to assist engineers in evaluating stress and to test the strength of load bearing structures

and machinery.

Looking to the future, Boman said he believed that the most interesting developments over the next few years would be in teleinformatics, which he defined as "the bringing together of ideas and techniques from the field of telecommunications, data technology and text handling."

Boman announced that the company would be involved in at least one such project with an international oil company during 1981.

Because of the dispersion of people and towns in Scandinavia, that area was recently identified in the IDC Europa report as one of the fastest growth areas for telecommunications.

But Boman said Computas would be looking to the company's international activities in areas such as India, the Middle East and Korea as a prime source of new business. He implied that Computas would be giving serious consideration to opening a base in Singapore in 1981.

## Share forecasts put Honeywell ahead

COMPANY	RECENT SHARE PRICE	'78 EARNINGS PER SHARE	'79 EARNINGS PER SHARE	5 YEAR TREND	IBES CONSENSUS	CHANGE IN STOCK PRICE DEC. 31, 1978 - 1980
Amdahl	\$284	1.02	1.05	1.68	-	-
Auto Data Pro	\$471	2.21	3.24	3.03	-	+41.4%
Burroughs	\$503	7.45	7.92	7.05	-	-31.3%
Comp Sciences	\$201	1.70	2.84	2.26	-	+2.0%
Control Data	\$851	6.68	10.81	8.26	-	+30.0%
Data General	\$501	4.82	7.73	6.17	-	+20.0%
Data Point	\$101	2.83	5.57	4.61	-	+128.3%
Digital Equipment	\$871	4.10	7.48	6.24	-	+37.8%
Elc Data Systems	\$38	1.82	2.30	2.56	-	+22.0%
Harris	\$484	2.39	3.58	3.02	-	+68.6%
Hewlett-Packard	\$841	3.43	5.37	5.00	-	+51.4%
Honeywell	\$101	10.85	15.34	11.78	-	+34.2%
Intel	\$38	1.80	3.23	2.57	-	-
IBM	\$65	5.18	6.67	6.58	-	+5.4%
Litton Ind	\$74	4.68	11.81	7.87	-	-
Memorex	\$101	3.91	NA	1.60	-	-28.7%
Motrola	\$671	4.96	8.05	6.18	-	-
NCR	\$611	8.78	13.83	10.04	-	+8.3%
NatSemi	\$331	2.58	4.22	4.16	-	-
Raytheon	\$841	8.30	9.31	7.93	-	+64.2%
Sperry	\$661	6.80	8.73	8.38	-	+25.6%
Storage Tech	\$191	1.68	3.01	2.10	-	+30.2%
Tandy	\$431	3.23	6.89	5.47	-	+21.6%
Texas Instruments	\$1121	7.58	12.01	8.89	-	+37.2%
Wang Lab B	\$361	0.59	1.58	1.43	-	-

Five-year trend earnings per share estimate based on log linear least squares growth rate. Consensus estimate from Institutional Brokers Estimate System.

EACH year the American business magazine Business Week produces a forecast of earnings per share for all the major US companies. Computer Weekly has taken an abstract of this year's forecasts where they relate to computer companies and we publish that list, with share price appreciation and depreciation as it occurred last year.

Points of interest are that on an earnings per share basis Honeywell comes out best in both the five-year trend and under the conservative revising of that figure by the compilers of the table.

IBM, on a five-year basis, looks set to improve earnings per share by about 20% - very unglamorous given IBM's image and track record. The IBM prospects come up much the same under the consensus view.

Only NCR is seen, with Honeywell, getting its earnings per share into double digits.

Control Data is forecast to share third place, with a potential rise of nearly 50%.

Only Memorex is seen as producing an earnings decline over the five-year period, though Burroughs, with its recent problems, must be a candidate for a downward revision.

Compared to other sectors of American industry the computer

companies show a consistently higher five-year trend, even when the consensus view is taken into account.

There is no similar list in the UK and only six companies listed on any of the stock exchange markets could be classed as predominantly computer companies.

The data in the table on the left was compiled by Standards & Poors Computas Services Inc from such sources as statistical services, newspapers, registration statements and company reports that SPCS believes to be reliable but are not guaranteed by either SPCS or Business Week as to correctness or completeness. The material is not an offer or a solicitation to buy or sell any security.

### Sharp growth

TURNOVER at I. P. Sharp Associates, the international APL time sharing service, was up 40% last year to £16.3 million. The 600 staff of the company will share in a record £27,000 handout, nearly three times better than last year's profit shareout of just over £100,000.

The company is planning to open new offices in Singapore, Hong Kong and Bahrain.

## Mannesmann buys half of Kienzle

KIENZLE, the West German DP to taxi meter company, is to receive a cash injection of £8 million from Mannesmann, the engineering group. In return, the Kienzle family, who currently own Kienzle, will part with 50% of their equity for an undisclosed sum, understood to be £10 million.

The deal values Kienzle at £20 million, against turnover of £160 million and a workforce of over 8,500.

Mr Evans, joint managing director of the Kienzle UK company, said he was delighted with the deal, which would enable the com-

pany to go farther and faster in developing new products.

He hoped that the family atmosphere which had always been a feature of the company would remain, he said; Kienzle would not lose its identity under the deal and would continue to trade under its existing name.

Kienzle's UK company was set up in 1968 and now has a turnover of £10 million and employs 420.

The company specialises in supplying computerised accounting systems based on the K1900 machine to first time users. The company has recently ex-

panded upmarket with the 9066 mini.

Mannesmann, the engineering giant which has bought into Kienzle, had turnover last year of £3 billion, and profits of £100 million. One of the reasons quoted for the "partnership deal" is Mannesmann's anxiety to buy into growth oriented and profitable areas.

Mannesmann's profitability, measured against turnover was a mere 2.5%. The company, like all capital project oriented business, has been under additional pressure since the recession began to affect Germany.

## Capital for UK firms

ANOTHER venture capital source has emerged in the UK, this time in rural Cambridge. Venture Founders is a company set up by Brian Haslett, a graduate of Trinity College, Cambridge.

Haslett has just returned from a 10-year stint in America where he learnt how venture capital was used, and now has £2 million on offer to high technology entrepreneurs.

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VDU operator efficiency will also benefit from the 24 data lines carrying 80 or 132 characters, and the horizontal scrolling facility which prevents text from being lost while changing from one format to the other.

Eight screen-labelled soft keys provide the flexibility to handle current and future applications, without the need to memorise function codes and positions.

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## Leasing profits are up

COMDISC Incorporated, the leasing company specialising in IBM kit, reports increased turnover for the first quarter of the fiscal year 1980/81. Revenues rose to £35.8 million, against £25.8 million in the same quarter of 1978/80.

Profit for the quarter was £1.49 million, against £950,000 the previous year.

The chairman of the company

noted that IBM's announcement of the 3081 and reduced prices for the 303X series had ended uncertainty in the marketplace.

The chairman said that Comdisc's business 'increased during the second half of the quarter and the company expected this increase to be maintained, particularly when IBM announces delivery dates for the 3081.

## Buoyant first half at Racal

RACAL continues to report excellent results and to absorb the Decca acquisition without suffering in either profit or growth terms.

The first-half figures for the 1980/81 financial year show

turnover for the half-year up by over 20% to £240.6 million, compared with £199.2 million for the same period in 1979.

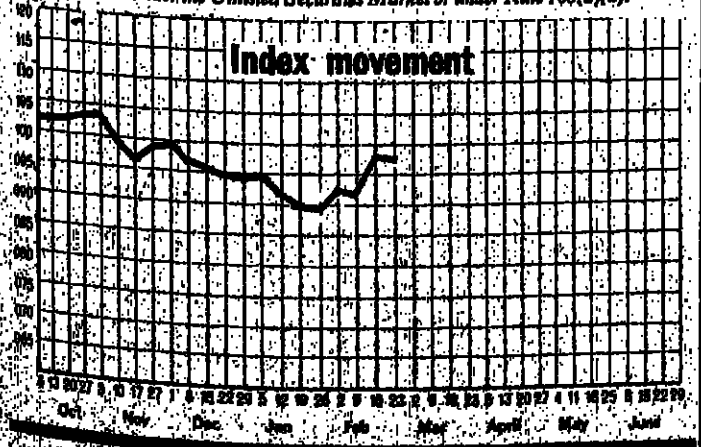
Profit rose 13% to £26.5 million compared to £23.3 million in the same period of 1979.

## CW SHARES TABLE

Index: 96.43 Change: -0.28		US Stocks	
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102	Low	102	Low
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129	High	129	High
130	Low	130	Low
131	High	131	High
132	Low	132	Low
133	High	133	High
134	Low	134	Low
135	High	135	High
136	Low	136	Low
137	High	137	High
138	Low	138	Low
139	High	139	High
140	Low	140	Low
141	High	141	High
142	Low	142	Low
143	High	143	High
144	Low	144	Low
145	High	145	High
146	Low	146	Low
147	High	147	High
148	Low	148	Low
149	High	149	High
150	Low	150	Low

The table shows the closing prices in London on Friday and in America on Thursday. The share index is based on the prices of the UK companies in the table. Highs and Lows have been adjusted where necessary.

\* Shares traded under the United Securities Market or under Rule 163(2)(a).



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# Look for self-adjusting opportunities when designing systems

VERY few self-adjusting system designs seem to be used in practice or reported in the literature. Yet they have proved useful on occasion; they simplify our system by taking over the burden of changing it to new operational conditions.

One of the most common and useful examples of self-adjusting software is found in the many operating systems which adjust program priorities and primary memory space usage according to current conditions. In inventory control systems the use of current data on orders, combined with historical data, serves as a basis for adjusting the minimum order quantity to a more interesting number than some constant number.

In the early days of disc drives ("RAMAC" for the old timers) a useful self-adjusting concept was to record the activity count in each record, and later, during file reorganisation, make use of that number to ensure that the currently most active records were placed in the best positions for fast accessing. I still use this concept, an activity counter in control fields of each record, almost as a standard design specification, because in addition to its optimising ability it can be used for double checking recovery routines (did all updates get repeated?) and has potential as a security check (unusual activity might indicate intentional fraud or errors).

In one database system we discovered by accident that when the file had been added to heavily without a file reorganisation, it was much faster to access the records via a detailed index (which always required two seek operations, but never more) than via an indexed sequential search which started with an index in primary memory, and then theoretically needed only one seek search and then perhaps sequential reads on the same cylinder.

This led to the discovery that we could sample and time each method in the morning start-up routines and then simply choose the access method which was operating fastest that day.

How many of you have thought of the concept of a self-adjusting database access method? It might be more effective than a single method, no matter how effective that method is.

What we simplified in this case was the operational need to worry about file reorganisation so often in order to maintain reasonable performance. I am surprised that concepts like the two above-mentioned file optimisation ideas are nowhere to be found in database and file organisation literature (I'd be happy to be corrected!).

A steel company wanted better reasonable checking in an on-line order entry system. They wanted to avoid repeating the ordered quantity twice, and were not satisfied just checking that the quantity was not utterly ridiculous.

The idea of giving reasonable limits on major groups of products was discarded as not providing tight enough controls. The idea of giving each individual product a maximum reasonable order quantity indicator in its record, was at first discarded as being too difficult to determine, and too difficult to keep updated in a reasonable way. Then we considered the possibility of creating and updating the "maximum reasonable quantity" field by simply putting the highest quantity actually ordered in the field and requiring confirmation from the operator for any higher quantities. This simple design idea was accepted.

It is not difficult to imagine increased sophistication by keeping track of minimum quantities, and keeping track of common patterns (such as ordering whole numbers, dozens, fives, odd numbers or groups of, say, 46 because of packaging) and reacting when unusual deviations occur. I have never seen this pattern recognition alternative, but course participants have claimed to have implemented variations of it successfully. It's an idea worth collecting.

If you think about it we are really talking about programming the kind of reasonable checking that human clerks perform

more or less unconsciously. They react to unusual patterns or quantities, based on what they have experienced as normal.

In another application of this principle, an Austrian savings bank posed the problem that they wanted to use the birthdate of personal account holders as a security and reliability check before approving cheque amounts by telephone. The problem was how to collect a million birthdates for their database before beginning the system. I suggested to the DP manager who posed the problem to me on a course, that they start up without the birthdate. It would be present (due to a previous inquiry) it was simply noted in the database for future reference. If desired another security check such as address or telephone number could be used temporarily. The DP manager was overjoyed to find such a simple way of getting this scheme on the air.

I have used it in many variations (example, customer name and address collected as the first order comes in, and not by a special file update to register the customer before any order can be processed).

## 14 YEARS AGO

From Computer Weekly of February 23, 1967 (this column temporarily replaces our Ten Years Ago feature, due to the postal strike in February and March, 1971, which resulted in the suspension of Computer Weekly distribution):

WORK on designing a traffic control digital communications network (DCN) based on a British computer analogue to the Honeywell DPP 516 has been under way for the last year. This was announced by National Physical Laboratory, Autonomics Division director D. Davies at an Institute of Electrical Engineers' conference dealing with message switching technology. Elliott-Automation will take over GEC Computer and Automation Ltd, the GEC subsidiary which holds a five-year UK manufacturing and sales licence for the SDS range of computers. Sigma computers are being sought currently by both the Medical Research Council and the Chilton Atlas Laboratory. Elliott-Automation is also involved in tendering for a computer system to service automatic air traffic control data for Eurocontrol, the Brussels based organisation that monitors the higher regions of airspace above Western Europe. E-A joins Ateliers de Constructions Electriques du Charolais (Belgium), Standard Elektrik Lorenz (Federal Republic of Germany) and Compagnie Generale de Constructions Telegraphiques (France) in the four-member consortium bidding for the contract.



Tom Gilb is an independent consultant, lecturer and author on computing topics.

In more general terms, it seems as though we have picked up some now obsolete habits in our old systems, and carried them through to current systems. We don't need to have separate processes for registering things like accounts and products before we can refer to them "via their number". We can capture data about them as we process current transactions on them. This tends to improve the response of the systems. It gets the systems on the air earlier, too.

So, consider letting current transaction data help you to keep up-to-date in your databases and tables. Look for self-adjusting opportunities when you design systems — they are present in most systems if you are tuned in to them.

Tom Gilb

## LEGAL OPINION

### Stamp your name on it!



Bryan Niblett is a barrister and computer scientist specialising in the legal problems associated with computers.

IT IS slowly becoming recognised that copyright law is an effective and simple means of protecting ownership of computer programs. A decision of the US courts in a case involving Data Cash Systems, first reported in late 1979, appeared to put copyright protection in some jeopardy — at least in the US and for programs embodied in read only memory. In fact an appeal showed the fears were premature, but the case still has an important lesson for those in the UK who license software overseas.

The action was between Data Cash and the JS&A Group, first heard in a Federal District Court in Chicago. Data Cash had employed a consultant to develop a program which was able to play chess at six different levels of difficulty. The program took the usual form: instructions were coded in a high-level language to produce source code, and this was compiled into an assembly code used to create an object program in ROM. The ROM was installed in a game marketed under the name Computech. In the US (the rules are different here) a program must be registered and deposited with the Copyright Office, if it is to have copyright protection, and this was done.

A copyright notice also appeared on the source program and its copies. Computech sales began in 1977 and reached 2,500 by the end of the year.

At that time Data Cash discovered that identical ROM was being manufactured by a company in Hong Kong and was to be imported by JS&A as its own Computech chess. After unsuccessful attempts to prevent marketing of the rival which was admitted to be a direct copy of the Computech ROM, Data Cash began the action for copyright infringement and unfair competition. JS&A responded by asking the Chicago court for summary judgment against Data Cash on the basis that it had a complete answer to the action.

The judge in the Chicago District Court held, surprisingly,

that the ROM marketed by JS&A was not a "copy" within the meaning of US copyright law, asserted that a copy must be in form which others can see or read. This was a narrow judgment, since neither party argued this particular issue, indeed neither attempted to defend the judgment on appeal.

In the US Court of Appeals there was no discussion of copyright infringement, the court turning exclusively to whether the program, in the form of the ROM, had infringed the public domain prior duplication by JS&A. The court found that a copyright notice imprinted on the source code, ROM, or the chess board packaging or the accompanying instructions.

Copyright protection is a (though not in the UK) not a notification of a claim of copyright by the inclusion of a copyright notice on all publicly distributed copies from which the work can be directly or with the aid of a machine. Failure to place copyright notice in the ROM, which all who read the program could not avoid seeing it was held to be a violation of the Data Cash claim, and a decision of the District Court affirmed. Nevertheless it is possible that the plaintiff might have taken action for copyright infringement which has yet to be tried.

The lesson for those in the UK who market programs overseas is not that copyright protection is ineffective, but that care must be taken to include a copyright notice on all copies of the program.

Bryan Niblett

## ComputerWeekly

Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS  
Thursday, February 26, 1981

### An industry that expects more

REMEMBER the days when you could while away your time on the Tube finding out if you'd make a computer programmer? The industry was then so desperate for staff that, according to the adverts, if you could follow the sequence 5, 7, 9, 11 with the number 13, you were made.

Flick through the adverts at the back of CW these days and you get a very different picture. It's no longer a matter of just knowing a language or an operating system, or even a machine. Often experience of a particular applications area is requested: "banking and insurance... realistic commercial outlook... a total of four years' experience in DP is expected." The key word is experience.

Graduate recruitment has been drastically cut by many firms, and some programmers — the latest casualties being from that doyen of the software scene, CAP — are even finding themselves redundant. The recession has meant that people are sitting tight with the jobs they already have.

However, the much-discussed "people problem" has not disappeared. There are areas — research and development was one pointed out on this page last week — where the right people are in great demand and short supply.

Systems programmers, designers, software engineers, and people with a foot in both software and hardware camps are still able to command the kind of respect, not to mention salary, that programmers used to get simply for being in the right trade at the right time.

This is not due just to the rarity of such skills, though it does suggest that it is not just Cobol-coders that TOPS should be training. It's a reflection of the fact that the computer industry itself expects more from its people as well as its machines these days.

Everyone else is trying to make the most of existing resources efficiently, as witnessed by the boom in such application areas as financial modelling and materials planning. Users are allocating computer resources more carefully, not just turning to the package solution, and making more use of productivity aids where in-house development is inevitable.

That means more effort put into activities which give the end user more power; operating systems, development aids and other such tools. The result is bound to be (as has long been foreseen, if somewhat overestimated) less need for the common-or-garden programmer.

It's not such a bad thing if no applications programmer ever has to write a date routine again. The end user is increasingly aware that quality matters — and so it should.

## Man of vision

FOR those who feel the days of the great British engineer/entrepreneurs are over, last week brought welcome news. Clive Sinclair, pioneer of the pocket calculator and most recently the £100 computer, popped up to prove that, given the determination and intellect, and just a little help from your friends (in this case the NRDC and the Scottish Economic Planning Department) all things are possible, even in the worst of economic recessions.

It was just a short time ago that Sinclair expressed an ambition to produce a miniature flat-screen TV, and true to form here it was, looking deceptively simple (see page 6).

Better than the prospect of pocket television itself, however, was the prospect of 1,000 new jobs, and the demonstration that for the right project, the machinery still exists within government to provide a good measure of financial backing. The blood runs cold when Sinclair reveals that facilities and finance in Hong Kong made it a strong contender as a manufacturing site.

As a lesson for all manufacturing industry, one is reminded of one of Sir Keith Joseph's oft-quoted aphorisms, that success in manufacturing industry is simply a question of producing a product that the customer wants, at a price he can afford.

Sinclair seems to have taken this to its logical conclusion by predicting what the customer will want at a price below his expectations.

1984 and all that... This week's example of the strange things people say in the media about computers was sent in by M. D. Walker of London N16, who writes:

"Well, we can leave the teletext now, or more accurately the videotext... David Coleman on Grandstand, BBC1 following the display of football results on a VDU."

## LETTERS

### An invention that could 'make programming redundant'

IT was interesting to read about the article by Adrian Berry in the Daily Telegraph (1984 and All That, February 19) regarding the "device" that can be led into any computer and make programming redundant.

The device, known as "The Last One" (because in theory, it is the last program that any human would have to write) is the invention of David James and Scotty Bamberg in Ilminster, Somerset.

If the device is in fact a piece of hardware totally compatible with all computers and does all that it is said it can do, then indeed this is truly a breakthrough. However if this device is a collection of programs that allows the user to ask for various types of programs to be written automatically, then I see no reason for the astounded response from the computing community.

I am sure most competent programmers using a high level language (and I do not regard Fortran

or Cobol to be ones) would be able to write a program which would, using an interactive technique, structure an information or calculation based program quite quickly.

Two years ago Normalair Garrett Ltd had reached a point in the development of a particular production system where over 1,000 individual routines had to be written. The language in use was (and always will be, I hope) APL, a very neat, precise, notation language.

Being a very logical and flexible language it took all of 45 minutes to write a program, which reduced the time required to write one of these routines from half a day to about 10 minutes. It did this by actually writing the routine for you. All that was required by the program user was for him or her to input the required question text, as these routines were interactive, plus any calculation lines required. The rest of the routines structure, naming of variables, labels and an-

swer setting, were all handled by this program.

I must now add that Normalair Garrett Ltd does not now use this technique for generating functions. The reason is clear.

If you have to resort to writing a program to write programs, then you are (1) using too low level language, (2) structuring your sub-routines at the wrong level.

We could not be accused of using a low level language. APL does in fact allow you to write your own language shorthand to suit your needs. However, further thought and investigation resulted in a very powerful set of sub-routines (slave routines) that allowed interactive programs to be written very quickly, yet gave the programmer sufficient control over the internal structure of the programs he was writing. This in the end proved to be the best compromise.

E. P. GOROCHOWSKI

Normalair Garrett Limited  
Yeovil

## Ideas of an imaginative teacher

MR LEIGH asks (CW, February 12) is it fair to introduce a new set of symbols and call them conventional.

I didn't introduce them. They are used throughout Ken Bowles' book, Problem Solving Using Pascal (Springer Verlag, 1977), and there are earlier versions of the book. As the originator of UCSD Pascal and an original and imaginative teacher his ideas merit serious attention.

If they did not exist, they would need to be invented because once it is understood that flowcharts are not appropriate for structured programming, something else must be sought. There are two other attempts to give a graphical view of well-structured programs: iteration graphs and design structure diagrams.

I do not know how much Ken Bowles' structure diagrams are used in America, but Danish

teachers use them as the natural aid to programming in Comal. I believe that structure diagrams meet Mr Leigh's criteria of practicability inside and outside education.

ROY ATHERTON  
Head of Computer Education  
Centre

Bulmershe College of  
Higher Education,  
Reading.

### How to get experience for a job

I SUGGEST that the many people with computing qualifications but no experience consider taking a part-time degree of Master of Philosophy with the computing department of the local university. This involves a minimum of two years' research starting at any time of year and in order to succeed you should be able to make a modest contribution to knowledge.

The national qualifications required will be a degree but an HND in an appropriate subject could well be considered equivalent. The fees vary widely from £250 per year upwards.

If you choose your project wisely to involve the computer language and field of computing which you wish to use in full-time employment you will be able to use the university's computer for four or five evenings a week and thus gain some worthwhile experience. You will also have the assistance of your supervisor.

The advantage of this course is that provided you do not spend more than 25 hours a week on the project and are able to take up full-time employment at any time if this is offered you can still draw unemployment benefit for the first year of unemployment, though social security if necessary in the second year could cause a problem.

If you can do without unemployment benefit a full-time course will take one year minimum and the fees will be higher.

D. FAWTHROP  
Full-time M.Phil student  
at Bradford University

## The biggest in Norway

COMPUTER WEEKLY takes a little time to reach us here in Norway, but we read with interest a short report concerning CAP Gemini Sogel taking over the Norwegian Data Logic (CW, Jan 22, 1981). Data Logic is described as "According to GGS Data Logic is the largest Norwegian company in the field of professional computing services, excluding service bureaux".

Our company, S. A. Computas, is "the largest Norwegian company in the field of professional computing services, excluding service bureaux".

We have had an excellent year in 1980 with turnover in excess of \$14 million (Data Logic had \$2 million) and staff up to more than 200 (Data Logic has 56). Now that we have established our new subsidiary in Sweden we reckon on being amongst the largest in Scandinavia too.

We are also building ourselves up very strongly in the international market place and intend to

become a force to be reckoned with.

Today you will find our departments or projects in London, Paris, Amsterdam, Hamburg, Portugal, Iraq, South Korea, Thailand and New Delhi.

DAG HAVERAABEN  
Vice-president  
A.S. Computas, Norway.

### Info exchange

I SUSPECT that an information exchange group does not exist for small to medium businesses who may be considering the future of electronic office systems beyond word processing. May I invite contact from anyone knowing of, or interested in forming, such a group.

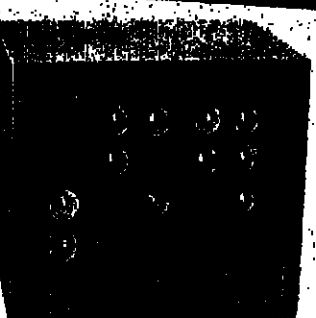
G. WISE  
Information Services  
Office Systems Controller  
Mazda Car Imports,  
Longfield Road,  
North Farm Industrial Estate,  
Tunbridge Wells.

## How to spot the (binary) time

IF when you look at my picture all you see is spots before your eyes, you are right. This is the latest gadget for the systems analyst who has everything, imported from the States by Tammy of Windsor. It is the ultimate in ergonomic technology, namely a binary read-out clock.

The digits run horizontally, one for hours, two for minutes, and two for seconds, and the bits run vertically with the ES&B at the top. This clock in the picture says 12:35 and 37 seconds. Note that there is none of this new-fangled nonsense about 24 hour time, and to keep you on your toes the minutes and seconds are in BCD while the hours are in straight binary. Clever stuff!

Thus you can be driven mad by flashing lights and keep your brain's powers of information processing exercised at the time. You get all this for a paltry £52 — in genuine plastic imitation wood, that is. If you want plastic imitation plastic, it will set you back £72.



The binary read-out clock.

Just listen to the telephone. The design boys at British Leyland are never slow to catch on to these things, and I hear rumours holes in the floor that enable you to push it along with your feet.

### Deja vu?

THERE are so many technical conferences on that no one can possibly get to them all and of jumping on the bandwagon of something new and exciting. But how often is the new thing just a rehash of the old? I was at a conference about the use of carbon-chip technology. The advantage of this is that nothing has to be done to the terminal to switch from ASCII to EBCDIC. The user simply learns a new code. The thing that is worrying the manufacturers is that someone might find that you don't need to buy the terminal at all; you can

## Read into it just what you wish!

I HAVE received a fascinating letter from the Aspen Institute for Humanistic Studies in New York, a well-known think tank, and it is on their impressive embossed letterhead paper.

The only strange thing about this letter is that it is totally blank. I know the portentous issues which bodies deal with require tight security: in communications, to the point of earth-shaking ideas, get do think in responsible hands, but I have to ask the Aspen people might have told me how to read their letters. I have tried all the tricks I can remember from Boy's Own Paper: rubbing it with a stick, holding it over a candle, sprinkling it with more from the north side of a tree, all to no avail. Presumably the reading instructions are themselves in invisible ink, and no one at Aspen has paid for the ink.

It is like those messages you get from the KGB saying "Dear Sir, we are sending you a message. It is very important. It is a message of love. It is a message of peace. It is a message of...".

On the other hand, maybe this is a new technique for interpersonal relationships. For too long, I have been a cry, communications have been totally operator-driven. Now, instead of forcing you to read what we have written, we send you a blank letter for you to read into it a hint, you wish. As



"Cancel all my appointments from Hradshap until I shall return these flying saucers!"

ongoing credibility situation. This is an idea the Aspen people have picked up from the KGB to their gurus in India, and understand, it is a technique to tell people what they want to hear, rather than what you say the truth. Thus if you get the last bus gone you will want it not to have gone, and they will tell you it hasn't gone to please you.

The other possibility is that Aspen letter is that it is part of a deliberate campaign to make information expensive. The more much less burdened you feel, if every piece of information received was blank! The first time I want to see arriving in my blank bills.

David Coleman on Grandstand, BBC1 following the display of football results on a VDU.

## Don't miss the Financial Times Survey on Computers

to be published on 2 March 1981

Make sure you get your copy of the Financial Times.

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# 'Ops should be chosen for their logical thinking and abstract reasoning'

PROTOCOL Operations' inaugural event at the Coburg Hotel, Bayswater, London was a greater success than its organisers had anticipated. More than 60 managerial heavyweights ("I only know half of them here," said director Chris Schaefer) heard four speakers talk of the company's wares.

Graham Lund, operations manager for Royal London Mutual Insurance, chaired the proceedings and said that the purpose of the forum was to look at various methods of training.

The first speaker, Phil Wilson, who is ops manager for the Reader's Digest, gave his thoughts on tailoring courses for particular installations.

An advocate of increased responsibility for the operations department, he encourages the view that operators should be chosen for

"their logical thinking and abstract reasoning power". He feels that the future will bring technical hurdles for ops as they become involved with more sophisticated software, distributed processing and telecommunications. (He will be featured on this page soon dangling from a hang-glider.)

Wilson was followed by John Davies, Whitbread operations manager. He talked about external education and training courses.

The next speaker, consultant Henry Trull, spoke of systems and operations interface. A Protocol orthodoxy will be the notion that much systems work and virtually all networking is the proper preserve of operations.

Managing director Malcolm Fry wrapped things up and said that Protocol was keeping its options open at this stage. He promised a

three-pronged attack on the market with operations training, consultancy work, and seminars and forums.

Another promise is for a steering committee of users with the power to influence what happens.

"It should be," says director Paul Brunton, "like a CUA with teeth."

The emphasis throughout the event was on training at all levels from the new entrant to the top dog.

Fry also listed the different times when training might become a priority. Included in that list were manufacturer or OS conversion, software enhancements and organisational restructuring.

"If we owned Rolls Royces," said Phil Wilson, "we wouldn't ask a chauffeur to drive it unless we were sure he could drive."



Malcolm Fry, managing director of Protocol Operations, making his pitch to some of his potential customers.

by Paul Fisher

## PROGRAMMERS PAGE

# Charting a course through the rocky terrain of tests

IN those halcyon days before recession, when people still thought of changing their jobs, it was common enough to be invited for "interview and aptitude testing on such and such a date at such and such a time."

In due course, you trudged along and sat down with other hushed applicants at a desk before a battery of tests.

Which tests you got was largely a matter of luck, as there is quite a variety going the rounds. Some are of the familiar IQ type (see Figure 1) - a mixture of numerical sequences, spatial figures, and verbal distortions, all to be sorted out.

Others are pure logic testers, a complicated flow that you follow tortuously through decision boxes and event paths, hanging on to your on-going calculation through diamond, square and go-to-exit.

A third type can be more tricky with limits on the rules such as add or divide only (or multiply and divide) and numbers in boxes, manipulated to achieve a certain result in a given few moves (see Figure 2).

Then the road leads from the academically pure to applied commercial problems where you can be lost forever among the impenetrable jargon of business.

All these are meant to test for the same thing - an aptitude for programming. How does it occur that an individual can score top marks on one test and fail another?

Are aptitude tests a valid predictor of future programming ability or merely a way of cutting down the number of applicants?

I sounded out two large and very

different organisations about their testing procedures - one a major aviation authority, and the other a leading insurance company, The Royal London Mutual.

The aviation authority tests all applicants. There are two fairly dissimilar types of test and chance determines which one is given - the three-part, hour-long test divided into verbal, numerical, and abstract sections (like the IQ variety), or a two-hour session on three logical problems.

Both tests apply equally to operators and programmers alike and successful candidates graduate to the next stage of interview. To reach this far the candidate must achieve a mark of 60 out of 85, around 75%.

The test is marked as a whole and while borderline cases are usually included for interview, fails and poor results are only carried forward exceptionally.

As the man from the aviation authority said: "Out of 30 applications, we would invite on average 12 for testing, of which eight would probably pass and be interviewed. Three of these might be offered a job."

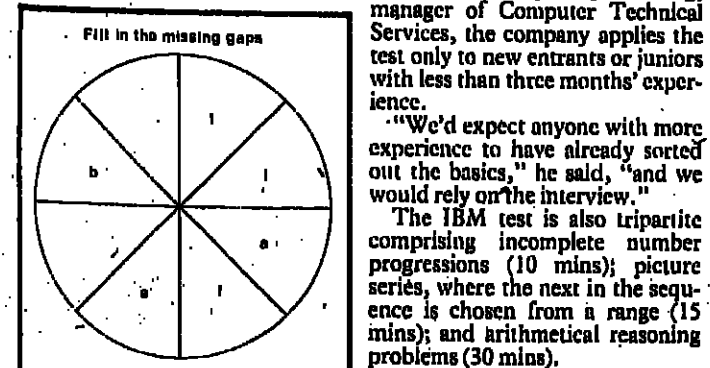
On the whole, the authority finds the test - whichever version is employed - acts as a good predictor of future programming, though not analytical, ability, particularly the abstract sections.

The Royal London Mutual Insurance Company gives the older IBM test developed about 15 years ago in preference to the similar but newer eight-year-old one which it claims is too easy.

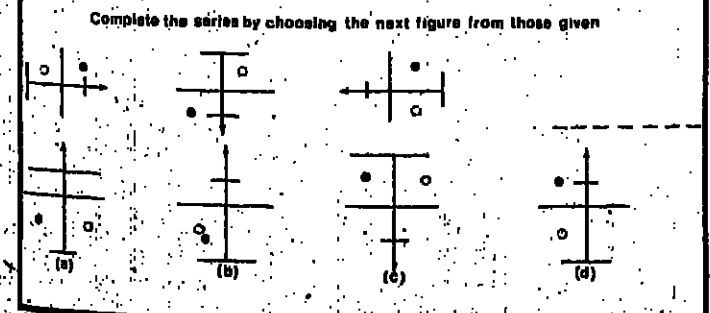
Conversely, says P. J. Harding, manager of Computer Technical Services, the company applies the test only to new entrants or juniors with less than three months' experience.

"We'd expect anyone with more experience to have already sorted out the basics," he says. "And we would rely on the interview."

The IBM test is also tripartite comprising incomplete number progressions (10 mins); picture series, where the next in the sequence is chosen from a range (15 mins); and arithmetical reasoning problems (30 mins).



Complete the series by choosing the next figure from those given









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# Bank of England on starting blocks for 'DP Olympiad' title

COMPUTASTARS and Computatug organiser Gordon Cairns does not display overt partiality towards entrants in his two competitions, but a native-born Scotsman may be forgiven a touch of North of the Tweed pride.

"I have just received the first Scottish entry for the 1981 competition," he explained. "It comes from the Edinburgh Regional Computing Centre and marks its debut in Computastars."

Cairns outlined the current entry position. "At present, I have received over 50 entries for Computastars, which is marginally ahead of the equivalent period last year."

"This is only an approximate verdict as this year marks the first occasion that I have designated a specific closing date for entries. That date is February 28 and means that potential entrants must speed up their applications."

"There is substantial interest from the banking sector, with Barclay's entering a nationally-selected squad while the Bank of England is scheduled to appear in the Southern area heats at Barnet on May 16."

"As you can imagine, I am giving considerable respect to the entry cheque from the Bank of England," he added.

"I believe that many potential entrants are still making the mistake of thinking that there is plenty of time left before they need submit their entries."

"The fact is, however, that our

closing date of February 28 (this coming Saturday) leaves little time for organisation before the regional events, with the Midlands and Northern heats at Birmingham on April 25 and at Cleckheaton on June 6 respectively.

"These preliminary heats are followed by the national final at the New Alexandra Stadium, Perry Bar, Birmingham on Sunday July 26, which gives both teams and individuals the opportunity of qualifying for the European finals in Holland."

Cairns explained that Computastars Europe will take place in Holland during the late summer or early autumn with Utrecht or Nijmegen the most likely venues.

Irrespective of the final decision about the Dutch venue, Cairns is more concerned at this stage with ensuring that our national Computastars and Computatug events attract a large and representative entry.

"Computatug has attracted only four men's and one woman's entry to date," he added. "I do not want to see a situation where the first heats also become the UK final by default."

All of which adds point to Cairns' appeal for a last effort to ensure a record entry for both events.

"Please make sure that your entry form - or at the very least, a verbal commitment to compete - reach the Croydon office by Saturday February 28 at the latest."

## COMPUTASTARS ENTRY FORM

We have read and accept the conditions of entry for the Computastars 1981 competition and would like to enter .....men's teams .....women's teams

Name of team(s).....

Company.....

Address.....

Name of contact for team(s).....

Telephone No..... Extension.....

Signature of DP manager or equivalent authority.....

Position held.....

The unit would like to compete in the following region: NORTH (Cleckheaton) MIDLANDS (Birmingham) SOUTH (Barnet). Please circle appropriate region.

Enclosed is £..... to cover the entry fees for the team(s) - £25 per team. Cheques payable to COMPUTASTARS LTD.

In all matters relating to the rules or conditions of entry the decision of the organisers is final.

Please send entry form and entry fees to COMPUTASTARS, 117b High Street, Croydon CR0 1QG. Tel: 01-688 6690

## COMPUTATUG ENTRY FORM

We have read and accept the conditions of entry for the Computatug 1981 competition and would like to enter .....men's teams .....women's teams

Name of team/individual.....

Company.....

Address.....

Name of contact for team(s).....

Telephone No..... Extension.....

Signature of DP manager or equivalent authority.....

Position held.....

The unit would like to compete in the following region: NORTH (Cleckheaton) MIDLANDS (Birmingham) SOUTH (Barnet). Please circle appropriate region.

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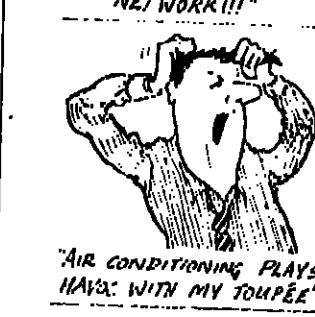
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This Computastars competitor is definitely on the (hockey) ball!



## Lighter side of DP life

HERE are nine cartoons. They all about computers and working life of an office. Write in nine captions and you'll win a £100 of free holiday - if you're the funniest, that is.

Sounds easy? Not so, and there are a couple of waste time and effort traps to avoid. The office of Efectia Gravis must be a director Mike Elman stuffed his reject entries to prove it.

They are the unlucky losers' competition organised by the London-based recruitment consultancy and aimed at managers of computer installations across the country. The prizes were £1200 and £100 travel vouchers to the winning three entries.



Winner Alex Hafele with his Brigitte.

The judges - Elman, 25, director Mike Hampton and Computer Weekly Editor Steve Timm, who also presented prizes - were subjected to all sorts of pressures.

The obvious one was the fact Efectia Gravis' name in captions. Several entries went as far as to work it into every sentence, including a particular man who set them to verse - but judges were having none of it.

Coming out on top as was Alex Hafele, whose entry shown here. He is operations controller at the Liverpool Victoria Friendly Society based in Southampton Row, London, and was at an installation of twin ICL 290 running under VME/B and DCL George 3.

"If you ran VME/B you'd have where my inspiration came from," he quipped at the prize giving ceremony last week. "Everyone in our installation knows of Ludd - I explain to them who he was and it's appropriate to VME/B" (see his cartoon).

Hafele, 30, started in computing as a van driver for ICL, transferred to operations in 1976 and has been operations controller at his present site for five years.



Second and third prize-winners Don Tyrrell (left) and Keith Goodwin.

He and his wife Brigitte, who helps him with a correspondence course at London University, leading to a BSc in Economics, plan to use their money to look up an old school friend in Canada. In fact the Hafele family seems to be on a lucky streak at present. As well as he heard he had won, his parents won a free trip for two to Los Angeles.

Second in the competition was Don Tyrrell, assistant installation manager at the regional computer centre in Harold Wood, Black for the North East Thames Regional Health Authority. Tyrrell, 46, has been in DP for 17 years.

Third placed, Keith Goodwin, bureau manager at the TCS Computer Bureau in Guildford, Surrey, will put his £100 voucher towards a hotel Christmas in the West Country.

Emma Bird looks at the future of Prestel

## Acting as gateway to viewdata systems

MARKET research has shown that business users value viewdata's capability for collecting information more highly than its information dissemination capability.

Its simplicity of use means that entering data into and retrieving it from company computers, which in the past was the exclusive province of DP professionals, can now be done by agents, dealers, maintenance engineers, salespeople (especially those working from home) and other employees.

The key issue is the involvement of the company's own computers, only possible at present using private viewdata systems. The provision of interfacing software between the public Prestel system and private company databases, leading to an increased ability to use Prestel as an information capturing system, could be crucial to its profitability.

The position of Prestel is illustrated by its present sales figures. The announced aim was to have 50,000 Prestel sets installed and working by the end of 1980. Although only 7,252 set users had registered by December 1980, 6,341 in businesses and 911 in homes (figures displayed on Prestel, December 19, 1980) new registrations are running at the rate of 500-600 per month despite the recession.

Of the business' sets roughly 30% are in use by television companies or British Telecom, organisations involved in promoting Prestel rather than end users. It has been estimated that a penetration of 50,000 sets would be necessary before acting as an information provider on Prestel became commercially profitable for the 130 main information providers and 300 subsidiary information providers at present in operation (Heys, 1980).

A Prestel success story is its use by the travel trade, which accounts for roughly 30% of the business sets installed.

Is the slow take-up of Prestel largely attributable to the tardiness of set manufacturers in making adapted sets available, and to the associated high cost (£1,000) of the



Dr Emma Bird is a senior member of the Systems Research Division at Urwick Nexos. She is qualified in psychology, psycholinguistics and industrial relations, and is focusing at present on the contribution which user friendly systems such as Prestel can make to business effectiveness.

non-mass-produced article? This is certainly a causal factor, but can we be confident that even if sets were provided free or at very low cost (as with the proposed distribution of "telephone directory" terminals in France) the Prestel service would reach acceptable levels of use?

The author's view is that Prestel, with the present emphasis on the provision rather than the collection of information, will be difficult to market profitably to business users, and that the idea of paying for information will remain alien to the majority of domestic users for at least the next five years.

Prestel is serving as a prototype public information service, emphasising ease of use and mass market appeal, but the advantages from the success of such a service may well be won by competing suppliers, who move into the market after they have learnt from Prestel's weaknesses and mimicked its virtues.

However, an extension to Prestel

Implications for survival	For	Neutral	Against
Colour and graphics	✓		
Page of use	✓		
Little readiness to pay for information			✓
Rather shopping via Prestel	✓		

Figure 1: Arguments for and against the survival of Prestel in the domestic market.

Implications for survival	For	Neutral	Against
Colour and graphics		✓	
Rather shopping via Prestel	✓		
Cost	✓		
Inadequate computer storage and processing capacity			✓
Scarcity of material			✓
Cost of use	✓		
Development of portable viewdata systems			✓
Provision of high quality databases access	✓		

Figure 2: Arguments for and against the survival of Prestel in the business market.

has recently been announced which could significantly improve its chances of profitability. This is the use of the Prestel system to provide the networking for the third party database access - a facility known as a gateway.

The promoters of Prestel hope that its combination of low cost and ease of use will be attractive and that, although relatively slow and having somewhat limited information retrieval capabilities, it will nevertheless appeal to enough users to make it successful financially.

Although its profitability depends on issues of cost, power and ease of use, other features are central to the Prestel concept. These include colour and graphics and two-way communication, allowing Prestel to be used for online analysis of data and for message exchange between users.

The development of this last feature, especially expressed as the gathering of information by companies (from the kinds of employees described above) will be a key factor in determining Prestel's future.

The configuration of Prestel's software allows the user to interact with the information provider via response frames - pages into which users can insert data or alphanumeric characters depending on the type of keypad. Many information providers, for example Which? magazine, British Rail and the Royal Automobile Club, now use response frames to elicit requests for further information in hard-copy form such as brochures.

The mass market orientation of Prestel has led to the use of response frames for "remote" shopping, purchasing goods at a distance from the point of sale. The first commercial application was made by a wine club. As an information provider it lists available wines on Prestel and then presents a response frame through which users can purchase cases by inputting their requirements plus their credit card numbers.

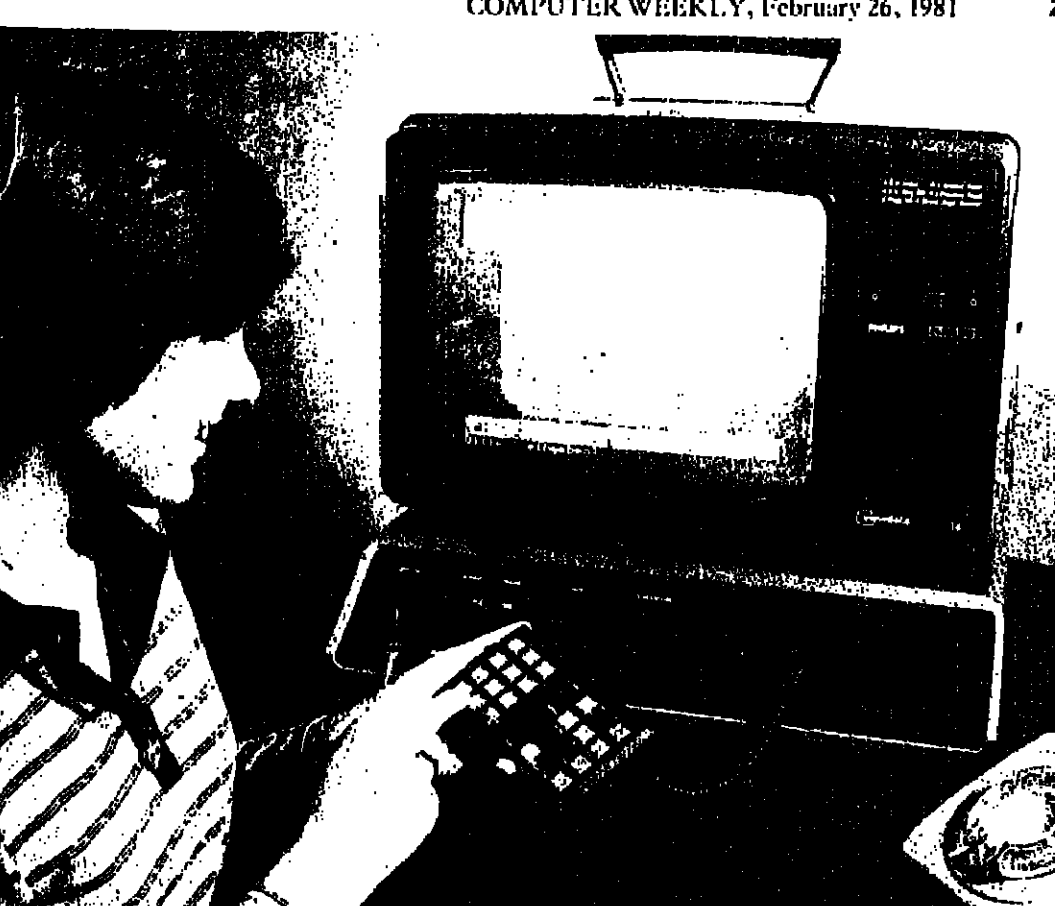
A number of goods can now be bought or reserved on Prestel including air tickets, hotel rooms, calculators and squash rackets.

The opportunity to shop from home or from the office should increase Prestel's attractiveness to the user, although it is too early to say whether or not this form of remote shopping will become really popular. There are indications that users will purchase goods, such as tickets, whose characteristics can be clearly specified in words and numbers, but not goods which need to be visually and tactually evaluated, like clothes or furniture.

From the supplier's point of view Prestel is limited by the fact that it does not yet deliver orders or reservations direct to the supplier's own system. Instead, orders have to be collected from the Prestel computer. The provision of third party database access is planned for the future. At the beginning of November 1980 a new strategy for attacking identifiable market sectors was announced by Prestel. The first targets were to be travel, investment, commercial property and agriculture.

A large part of the Prestel database is devoted to information on rail and flight schedules, holidays and tourism. Over 1,000 of the 5,600 travel agents in the UK now have a Prestel terminal.

But Prestel management's plan of encouraging greater use by the travel industry has encountered a setback caused by a technical malfunction - holiday bookings cannot yet be made and confirmed for walk-in clients. A number of travel operators are therefore turning away from Prestel to private viewdata systems which offer ease



Shopping in West Germany via the Prestel-based viewdata system Bildschirmtext, using Gateway software. Similar facilities may be available in the UK when British Telecom introduces Gateway in 1982.

of this problem by using a software gateway into the operators' reservations computer system.

Tour operator Thomas Cook has spent £250,000 on viewdata including terminals and processing hardware. In November 1980 it paid £32,000 for a three-year licence for the IVS-3 private viewdata system, owned by Argon and marketed in the UK by Systems Designers Ltd, SDL.

It will be used as a point-of-sale system for both checking availability and ordering holidays. IVS-3 is expected to interface to an IBM 4341, making the IBM-stored files available on the private viewdata terminals.

Thomson Holidays is also planning to beat Prestel's limitation on bookings and confirmations by installing a private viewdata system. As with Thomas Cook, the system will provide a gateway as well as providing across-the-board holiday information.

If it is to operate profitably, Prestel will need to adjust to the upsurge of private viewdata systems. The best way of doing this would seem to be to offer a service which capitalises on the existence of private viewdata. The provision of networking for third party database access would be an ideal means.

Plans were announced on February 12, 1981 to increase the volume of information accessible through Prestel by using a data communications network to link it to large-scale specialised databases. Designated Gateway (a classic case of a generic term given a specific meaning), the new facility allows for two-way interaction between a Prestel terminal and a private business computer system.

This approach has been adopted by the Deutsche Bundespost Bildschirmtext videotex system which provides a packet switching interface for information providers' own computers as an integral part of the videotex network. Argon International was commissioned to design the software, and subcontracted the development work to SDL.

British Telecom has recently bought the worldwide marketing rights to this software and plans to offer Gateway as a public service in the UK starting in March 1982. The capability for accessing third party databases was welcomed by the West German business community, and seems to meet the needs much better than the centralised Prestel architecture. The chief advantage of the Bildschirmtext architecture is that the network carries all orders, reservations, and enquiries at any terminal directly into the company's own computer.

Banking, travel operators and mail order companies in particular have been enthusiastic about the service. It is possible, for example, to

call up a bank computer system from a business or home Bildschirmtext terminal, interrogate the system to find out the state of an account, and then instruct the bank to carry out certain actions, for example to send money through the post.

The provision of Gateway to third party databases on the UK Prestel service will change its character fundamentally. The interfacing software will run on the 20 Prestel GEC 4082s. This national system for both checking availability and ordering holidays, IVS-3 is expected to interface to an IBM 4341, making the IBM-stored files available on the private viewdata terminals.

One of the first uses of Gateway is expected to be by businesses using their Prestel terminal to go directly into airline databases to book flights without involving a travel agent.

Access by local call is crucial to Prestel's chances of success as the networking agent. Competitors will have to rely on private networks of dedicated telephone lines, thus raising the cost of the service considerably.

Three competing networks are already in existence or under development - those of British Leyland, the Stock Exchange and Travicom. It is estimated that from five to ten per cent of users will be able to set up satisfactory private viewdata networks without using the public telephone network. The

remaining 90 per cent will prefer to use the Prestel networking solution.

Prestel has blazed the trail, but there is a danger that, as a public information service, it may not reap commercial benefits from being first. With Prestel defined as a carrier of low-cost, easy to retrieve information, the author's conclusion is that it would not, to use the Prestel executive's own words, "achieve overall economic viability within the limit of the loss-making period that the parties involved in Prestel are willing to accept."

It is the evidence of the importance of using viewdata to handle and augment internal company data that suggests the most realistic path for Prestel to follow: provision of the networking for third party database access.

If Prestel redefines itself in this way it can capitalise on the growth of private viewdata systems and its new job of acting as the gateway to both private viewdata and other computer systems should enable it to achieve sound economic viability.

This article derives from a longer report, to be published on March 2: *The Future of Prestel*, by Emma Bird, Urwick Nexos Limited, 46-50, Oldbath Road, Uxbridge, Middlesex, Ux. Obsolescence from Urwick Nexos Ltd, Close House, The Broadway, Farnham Common, Slough, Berks SL2 3PQ.

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# Novel key to hotel safety

A FRESH approach to computer-controlled hotel room security and management has been developed by ARC Ltd, a Watford-based high technology company specialising in microprocessor-based control equipment.

Called Guestkey, the system is claimed to be a comprehensive security and room management system. Incorporating the latest microprocessor technology, it dispenses with conventional keys, Guestkey issue being controlled by a central computer system.

Staff using the system are identified by a personal key and password. All keys issued during their shift are logged by the system, enabling management to carry out spot security checks.

Other vital security features include invalidating all stolen, lost or duplicated keys, detecting unauthorised keys, random key and lock combinations and immediate intruder alarm.

Guestkey does not rely on conventional locks with their tendency to error and has its own indepen-

dent power back up against mains failure. On the overall hotel management side, its ability to provide room status information gives a complete picture of room availability.

Shifts can be changed at will, enabling hotel staff to be reallocated groups of rooms without the security of the system being compromised.

Because the keys have to be "married" to correct locks and the lock combinations can be changed whenever necessary, issued keys may be taken away by guests as souvenirs of their stay in the hotel.

Cost of the Guestkey System, which includes the computer and print-out equipment, is £160 per room, depending on the size of the installation.

Alternatively, the cost of the system to the hotel on a typical rental agreement can be as low as 17p per room per day.

ARC Ltd (CW) Shakespeare Industrial Estate, Shakespeare Street, Watford, Herts WD2 8HD. Tel: Watford 443000.



Guestkey's Print-out unit enables the operator to check on individual rooms and overall security.

## VDU takes the (eye) strain

AN advanced microprocessor controlled VDU with a 12in screen and IBM-type keyboard, the Aller 1201 incorporates design and styling features to reduce operator fatigue. The possibility of eye strain is reduced by using a green screen phosphor, a clear 12 x 7 character matrix and non-reflective keytops.

Keyboard design includes a separate cluster for entering numeric data, and the scroll feature allows the operator to position the 24-line display "window" anywhere in the 50 lines held in the VDU's memory.

The RS 232 serial interface has switchable transmission rates between 75 and 9600 baud. Split transmission rates are available as an option, as is a 20mA current loop interface.

Full 96 character ASCII sets are available and custom characters or control codes may be added by simple changes.

Aller Services (CW, High Street, Aller, Somerset. Tel: 0458-250414.

## Central console for multiplexer

NEW Jersey-based Infotron Systems Corp has added new capabilities to its Supermux 680 Statistical Multiplexer allowing users to communicate with multiple units from a central console.

The console may be used to diagnose problems, transmit messages and receive status reports and the Supermux 680 reduces data communications costs by concentrating up to 32 input lines over a single 9,600 bits per second output.

Statistical techniques enable the microprocessor-controlled unit to transmit only active data inputs, conserving precious bandwidth so that the throughput is double or better than that of conventional multiplexers.

An operator can send a message to any channel in any local or remote Supermux 680 using the new console. User instructions may be transmitted to a remote location and diagnostic test messages may be composed.

The operator may request system statistics such as line and buffer utilisation, event and configuration reports from any local or remote Supermux 680. The re-

ports contain quantitative data useful in spotting potential problems and planning system expansion.

The line and buffer utilisation report shows average and peak data rates and buffer use. Error reports describe unusual occurrences and configuration reports show selected programming options and operating parameters for each system channel.

Consoles may be any ASCII-compatible CRT or printer, and are connected to a separate Supermux 680 unit. They may also be located away from the site.

The Supermux 680 multiplexer also provides error protection, priority control, data compression, ABR, downline loading, flow control and an optional built-in modem.

Inputs may be any combination of synchronous and asynchronous, dial-up and dedicated with initial protocols.

Infotron Systems Ltd (CW), Poundbury Road, Dorchester, Dorset DT1 2PG. Tel: 03066016.

# Data logger Orion heralds a new era

SOLARTRON Instrumentation Group has launched a data acquisition and sequence control range called Orion, which has three microprocessors and houses facilities normally found in many larger computer-controlled systems.

Orion is said to collect accurate data from a wide range of sensors, handling thermocouples, resistance thermometers and strain gauge transducers automatically.

Other devices like opto-sensors, magnetic pick-ups and plain voltage, current or resistance can be measured with equal ease and integrity.

Status and event inputs may be observed or quantified and events timed. Orion also measures timing events; inputs in binary or BCD and has the ability to gather readings from external modules such as single-chip A-to-D converters or counters.

All these functions are organised and controlled by simple front panel keys.

Orion can cope with 200 inputs or up to 600 with extension slaves at high speed which makes data

reduction essential. To meet this need, comprehensive facilities are provided.

The system caters for thresholds with dead bands, detection of change, maximum and minimum, mean value and standard deviation.

Data Logging manager, John Shave says, "We realised from the start that such versatility and power could mean involving the user with a programming language unless we designed something unusual. Orion requires no involvement with software. It's all built-in and accessed by a few keys on the front panel."

Solartron has achieved this by "soft" keys which interact with the display, the menus being organised to achieve setting up with a minimum of key strokes. This reflects Solartron's philosophy that the best loggers are those which can take measurements with the shortest possible set-up time.

When setting up is complete, programs are stored in memory with battery back-up and are avail-

able for automatic restart after power fail.

In addition, the tape cartridge can give permanent storage that may be loaded immediately when needed.

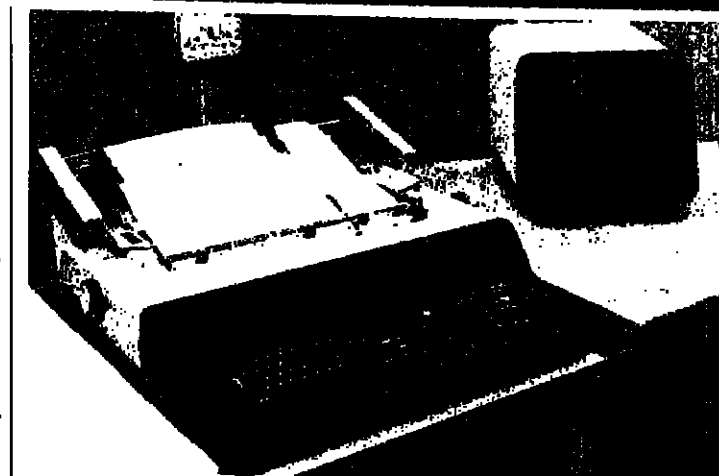
The cartridge can store 50,000 measurements and is only one of the built-in recorders, the other being a hard copy paper-strip printer.

Interfaces to RS232, RS422 or the GPIB permit external devices to be connected if required.

Solartron points out that Orion is multi-functional. It can interact with a test rig to make measurements and control the rig.

The company believes this product will expand the data logging market beyond the traditional research and test areas. Many industries require equipment to check a process or production line, monitor quality or control environmental tests, day-in day-out without costly labour overheads, says Solartron.

Solartron Electronic Group Ltd (CW), Victoria Road, Farnborough, Hants. Tel: 0252 44433.



The Facit D12 is aimed at the small business market.

## Multi-role calculator

THE FACIT D12 flexible disc (FD) accounting machine is an office computer developed specifically for small business use which has been designed to cope with all administration routines and is said to combine the roles of accounting machine, calculator, automatic billing machine and computer.

It is easy to use and install, can be placed on a desk and plugged into an ordinary socket and requires no specialist training, says the company.

The D12 can handle continuous forms, separate invoice sets, jour-

nals and ledger cards and the wide carriage should permit several documents to be used at once. The optional VDU can be used for interrogating files without hard copy print-out.

There is an indicator panel which shows the exact position of the program, and the routine can be interrupted for file interrogation and picked up at a later stage for operator guidance.

The system has 64K of memory and 1 megabyte of disc storage. Facit (CW), Maidstone Road, Rochester, Kent.

## VDU is set for the top

CPU Computers of Woking has introduced the Penland Mark VIII visual display unit which is expected to take over as the top selling model of the range.

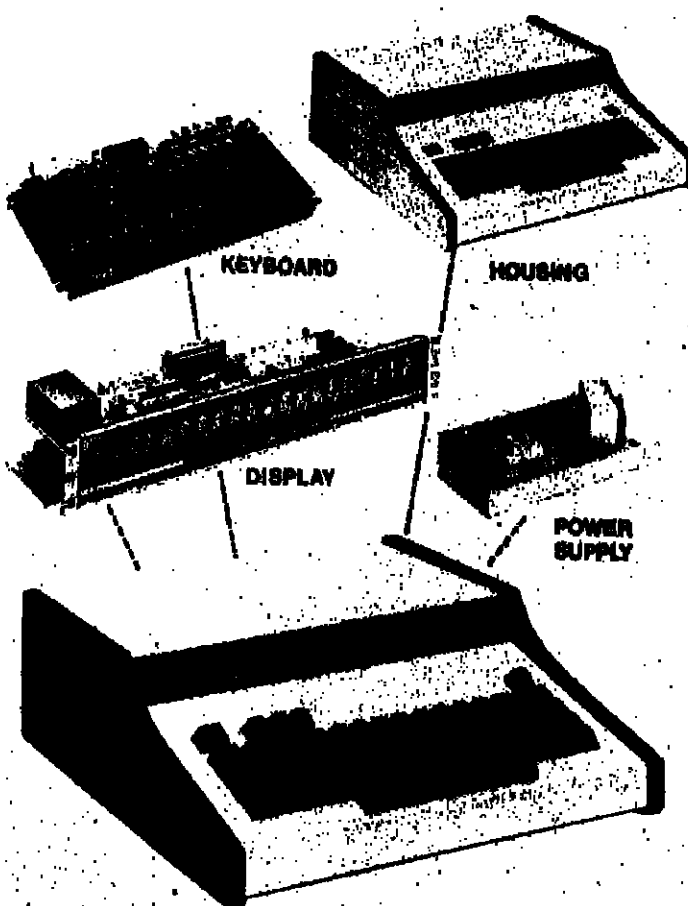
The keyboard has five cursor control keys plus a 62-key Qwerty layout and eight auxiliary function keys, 11-key numeric pad and four editing keys.

Visual features include block or underline cursor, steady or blinking plus protected fields, reverse video and half intensity controls. The Penland Mark VIII also includes auto line feed and scroll and X-Y cursor addressing.

There is a 12 inch screen with capacity for 1,920 characters in 24 lines of 80 characters.

The primary interface is RS232C, V24 with 15 baud rates from 50 to 9,600 baud and a 20-60 mA current loop interface and auxiliary peripheral interfaces are available.

Price of the Penland VIII starts from £465 according to specification, quantity etc. CPU Computers Ltd (CW), St. Johns, Woking, Surrey.



This four-part assembly comprises the complete Cherry system.

## Alphanumeric system for all-round usage

CHERRY has developed an Interactive Alphanumeric Display System comprising four basic modular components that can be used either individually or collectively as a comprehensive unit.

A self-contained 14-segment, 16/20 character alphanumeric single-line display controls a microprocessor-controlled circuit including drivers, character generator and refresh memory.

Switch-selectable features include full or half duplex; even, odd, or no parity; 3, 6, 7 or 8 data bits per character; 1 and 2 stop bits and 8-switch selectable baud rates from 110 or 9,600.

Three end-of-line modes are featured and there is left entry with automatic line feed; carriage return, writeover carriage return and horizontal scroll with five brightness levels available to provide a range of light output in 4 dB steps.

A fully addressable flashing cursor indicates the next character position to be written and cursor functions include backspace, tab, selective addressing, erase to end of line and erase to start of line.

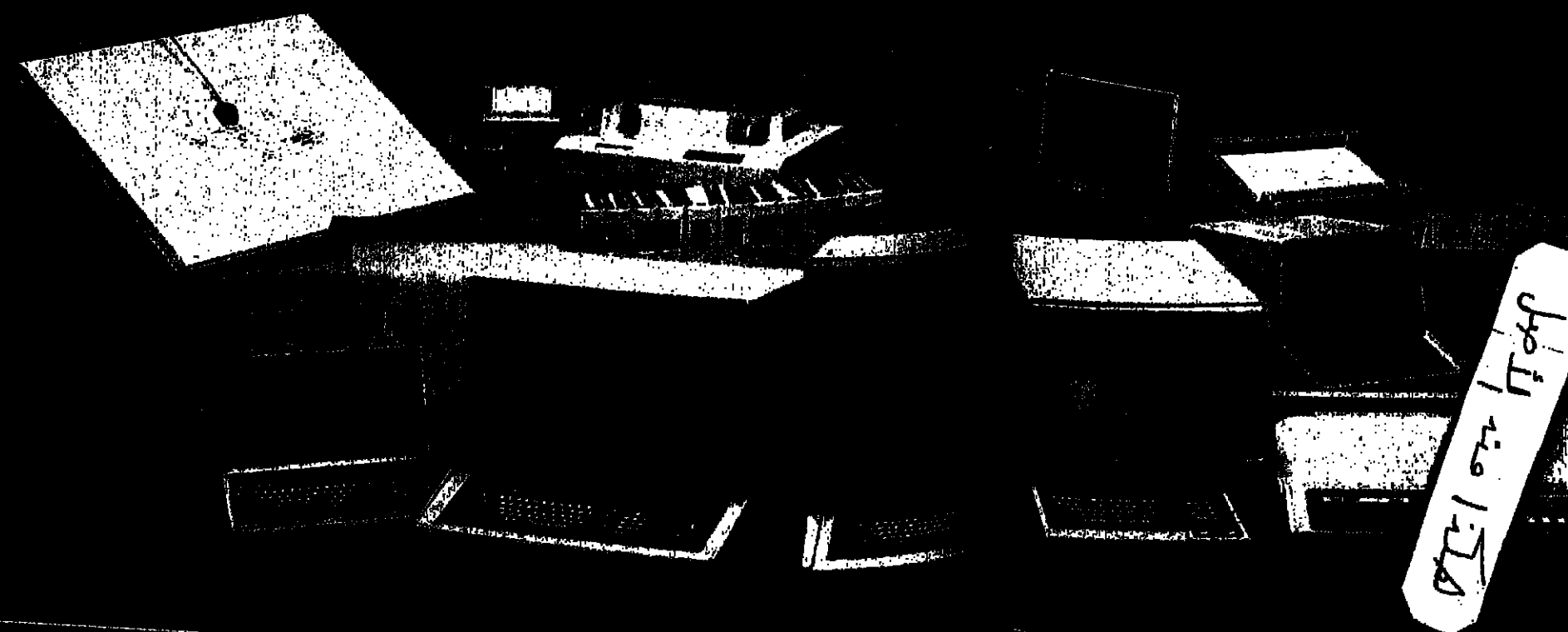
There are additional standard features like RS-232C, TTL or 20mA loop single power supply operation (3 VDC, 750mA), full I/O buffering, handshake for increased communications speed and full ASCII input.

The solid-state interactive keyboard was developed specifically for Cherry Interactive Display Systems and has 66 ASCII encoded keys plus functions for other keys with quick-change clear plastic replaceable tops.

The custom-designed enclosure is in beige aluminium with solid hardwood sides. Besides housing the other modules, space is also available to install additional hardware.

Cherry Electrical Products Ltd. (CW), Coldharbour Lane, Harpenden, Herts AL5 4UN. Tel: 05827 63100.

# The Graphic Standard



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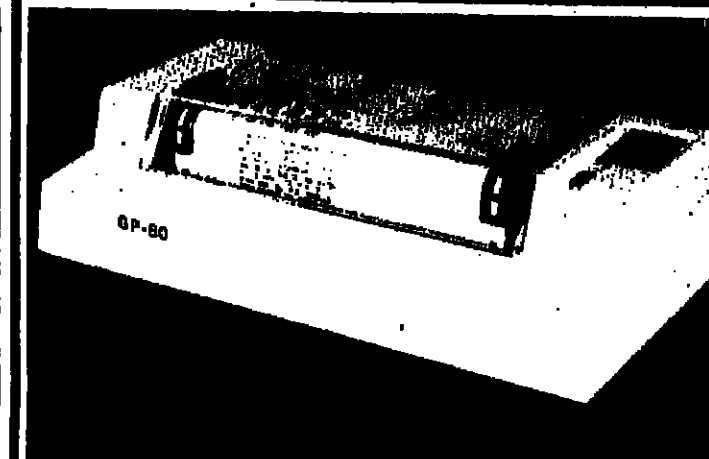
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The GP-80 matrix printer is compact and economical.

## Low-priced matrix printer has educational appeal

THE GP-80 is a high-performance matrix printer, principally intended for use in the commercial and educational fields.

Its £248 price tag is designed to ensure that the printer receives wide acceptance with the hobbyist and all who need hard copy from their microprocessor systems.

Printing rate is 30 characters per second, with a full 80 columns of 5 x 7 dot matrix format. The standard ASCII 96-character set is provided, with special English and German characters.

D.A. MacDonald Microprocessor Systems (CW), 3 Holmesland Drive, Botley, Hants. Tel: 04892 81108.

Forms up to a maximum eight-inch width may be used and are rear-loaded to an adjustable tractor. An original and two copies may be printed with suitable paper.

It measures 132mm x 172mm x 328mm and weighs 2.5 kg, its dimensions thus providing an additional advantage.

## Financial security device from Racal/Diebold

RACAL-MILGO Inc. of Miami has introduced a device for use with Diebold equipment that will permit financial institutions to lineshare security data and main channel data communications.

Called the Model 911 security interface module or 911/SIM, the product is the first result of last year's co-operative marketing plan involving Diebold and Racal-Milgo, in which financial institutions will be offered a combination of the firms' technologies to reduce data communications costs.

In this case, 911/SIM is incorporated with a variety of Racal-Milgo modems and the Diebold MPS 1020 proprietary security system to permit line sharing.

Operating on the same communications line as main channel, asynchronous or synchronous data, the 911/SIM runs at a data rate of 75 bits-per-second in full duplex mode.

It permits line-sharing by FSK channel operation apart from main channel operation on the high end of the communications bandwidth.

This separates the low speed security channel data transmission between remote security devices and the central security controller from main channel data transmission.

Unconditioned lines may be used for 911/SIM operations, but either C-2 or C-4 conditioning may be required in some cases.

Significant additional features of 911/SIM include provisions for 24-hour, battery-operated backup to prevent security information from being interrupted even if commercial power fails. There is also a dial backup option to restore service of leased lines fall and a loop system option in which security equipment may be polled in IBM 3600 financial networks environments.

CMOS microprocessor controllers enable all control, decision-making and communications functions to be implemented as well as system transparency to the main data communications network.

Racal-Milgo Inc (CW), 8600 N.W. 41st Street, Miami, Florida 33166.







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Please write for an application form to Miss V. A. Waters, Senior Personnel Officer, Glaxo Operations UK Ltd., Greenford Road, Greenford, Middx. or call 01-422 3434, ext. 340, quoting ref: FY/162.

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System Industries is one of the leading independent suppliers of business computer risk systems. We are a Chalfont-based public company with European headquarters in Woking, Surrey, and offices at Heathrow, throughout Europe.

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\* **FIELD ENGINEERS** to be responsible for installing and writing our products throughout the whole of the UK with some occasional European travel. At least two years' experience in the maintenance of DEC or DG minicomputers with experience on Disk, Tape and Memory Sub-systems a distinct advantage.

\* **TEST TECHNICIANS** to be responsible for final testing of computer disk systems at our newly created testing facilities. Experience on exchangeable or fixed media high capacity disk drives preferable.

\* **REPAIR TECHNICIANS** who will have gained a good grounding in digital and analogue techniques. Knowledge of high capacity disk drives preferable.

The company, an equal opportunity employer, offers an excellent remuneration package with extensive fringe benefits including: stock purchase plan, compulsory pension scheme with free life, accident, BUPA and sick pay insurance, four weeks annual holiday entitlement with three months paid sabbatical leave in the second year and for all Field Engineers, a company car will be provided.

For an appointment please ring Norma Johnson on Woking (048 62) 5077.

System Industries (Europe) System House, Guildford Road, Woking, Surrey GU24 7QQ

System Industries

## DATA BASE OPPORTUNITY

The North of Scotland Hydro-Electric Board are currently developing a large data-base for Premises & Customer Information to support all Associated Accounting and Engineering Systems. IDMS data base Software is being used and will operate on our dual ICL 2860 Computers in Aberdeen.

For this interesting and demanding project, additional staff with experience in design or implementation of CO-DASYL type data-bases are required, familiarity with ICL VMES operating environment, and terminal application would be additional advantages.

Attractive conditions including a salary in the range of £7,200 - £9,200. Inflation related Superannuation and assistance with relocation will be offered.

For further information telephone KEN HUTCHESON, 024 882671, or send personal and career details to:

COMPUTER SERVICE MANAGER  
NORTH SCOTLAND HYDRO-ELECTRIC BOARD  
COMPUTING AND ACCOUNTING CENTRE  
200 ABERDEEN ROAD, WEST ABERDEEN

(4601)

## IBM GSD SYSTEM RPG II LONDON - MANCHESTER

## PROGRAMMERS ANALYSTS PROJECT LEADERS

Altergo Business System Limited has vacancies for Programmers, Analysts and Project Leaders to work on its expanding IBM System/34/38 and Series 1 business throughout the U.K. and Europe.

These are long-term career positions which offer responsibility, high financial rewards and the opportunity to extend your skills and experience over a wide variety of applications and systems in the commercial and industrial fields.

We are particularly looking for people with enthusiasm, ambition and, above all, a professional outlook. We offer a dynamic organisation which recognises individual achievement. The rewards are a generous bonus scheme, six monthly salary reviews, excellent fringe benefits and an opportunity for rapid growth within the company.

**PROGRAMMERS/ANALYSTS** up to £10K plus benefits. Applicants should have at least four years' experience with RPG II. Knowledge of small IBM machines, especially the System/34 would be a distinct advantage.

**PROJECT LEADERS**, Negotiable. Applicants should have a minimum of 6 years' experience in the small business environment and ideally have been responsible for the design and installation of complete systems on IBM equipment.

If you feel that your potential can be realised through the challenge of working within an innovative and stimulating environment with secure prospects for future growth and career development, please telephone Barry Whitesman or Ruth Berger.

Barry Whitesman  
ALTERGO BUSINESS SYSTEMS LIMITED  
113 Great Russell Street  
London WC1B 3NQ  
Tel. 01-631 1666

Ruth Berger  
ALTERGO BUSINESS SYSTEMS LIMITED  
Orbits House, Albert Street  
Eccles, Manchester M30 0WL  
Tel. 061-707 4399

**altergo**

## CRUSADER INSURANCE COMPANY LIMITED

## OPPORTUNITIES AT CRUSADER

Crusader Insurance Company Limited currently has vacancies in their Data Processing department for experienced personnel. A wide variety of computer systems are controlled by a relatively small team of analysts and programmers, so that each individual can gain a much broader view than in many larger data processing departments.

The company's ICL 2956/10 computer configuration runs under DME/3 but a gradual transition to VME/K will be made. New systems will make use of IDMS and existing systems will be redeveloped to take advantage of new technologies. Our immediate requirements are for:

### SYSTEMS ANALYST to £8,500

This position involves systems analysis, design and implementation using ICL 1900 or 2900 series of computers for insurance applications. Candidates should have experience of systems analysis and design, and should be aged at least 24 years.

### APPLICATIONS PROGRAMMER to £7,500

Programming using COBOL for insurance applications. A minimum of two years' programming experience with COBOL on ICL 1900/2900 series is essential, with a knowledge of PLAN and/or MAXIMOP an advantage. Candidates should have a good academic background (including at least two GCE A Level passes) and be aged at least 24 years.

### THE BENEFITS

**SALARIES ARE DUE FOR REVIEW AGAIN ON 1st JULY 1981**

In addition to providing a pleasant working environment at Reigate in park-like surroundings, a full range of fringe benefits is available as follows:

- Annual Bonus
- Free Group Life Assurance Benefits
- Contributory Pension Scheme (after one years service)
- Staff House Purchase Scheme (normally after one year, but for those applicants who already have a mortgage, a subsidy will be offered on commencement)
- Relocation Assistance
- Free Luncheon Facilities
- Active Sports and Social Club
- Flexible Working Hours

Please telephone or write for an application form, to:

Mr. A. Williamson, Personnel Manager, Crusader Insurance Company Limited, Reigate, Surrey RH1 4BL. Telephone: Reigate (07372) 42424.

## PLYMOUTH POLYTECHNIC

FACULTY OF TECHNOLOGY  
DEPARTMENT OF  
MATHEMATICS  
STATISTICS AND COMPUTING

## LECTURER II/ SENIOR LECTURER COMPUTING/ INFORMATION SCIENCE

Applications are invited for the above post created to support expanding research and teaching commitment in computer studies at this Polytechnic.

The successful candidate should further the involvement of the department in informatics. Applications welcomed in particular from candidates qualified in information science or in computer science with a strong interest in non-traditional applications of computers. The successful candidate would be expected to contribute to the research activity of the department.

Salary: Lecturer II £8,012-£9,702 Senior Lecturer £9,952-£11,250

Application forms to be returned by Friday, 28th March 1981 can be obtained with further particulars from the Personnel Officer, Plymouth Polytechnic, Drake Circus, Plymouth PL4 8AA.

**D.P. Staff**  
We have a vacancy for a part-time computer programmer, giving you the chance to earn well, with a salary of £4,000 per annum. Contact: Mr. J. G. Smith, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936,



# SOUTH AFRICA

## Contract or Permanent

Our client, The Gold Division Information Service of ANGLO AMERICAN is looking for:

**PROJECT LEADERS, SYSTEMS ANALYSTS, ANALYST/PROGRAMMERS and PROGRAMMERS** with a minimum of four years data processing experience to work in one of the most sophisticated computer installations in South Africa. Situated in the country, they have IBM 370/158 and 3032 main frames (a 3033 is currently being installed), a wide range of mini computers at remote sites and about 400 terminals. They use the latest software tools including IMS database and data communications. Education and training is given top priority and the true data processing professional need not necessarily have a background with IBM equipment. IBM experience is however, required for the following further vacancies: **TRAINING MANAGER • DATABASE CONTROLLERS, DESIGNERS AND SUPPORT STAFF • SOFTWARE PROGRAMMERS AND SHIFTLADERS (MIN 5 YEARS EXPERIENCE).**

South Africa has much to offer—a booming economy, sunshine, low taxation and high living standards. The employment package offered by Anglo American is generous by South African standards and includes: • Top salaries plus a car for senior positions • Annual bonuses for permanent staff and end of contract bonuses • Housing at 5% of the basic salary • Allowances for water and electricity • Four or five weeks' leave per annum • Generous relocation assistance • Superb sports and social facilities.

This is an ideal opportunity to combine career progression, experience in a new country and a real possibility of saving.

Final interviews will be held in London at the end of March. For further information please contact Anne Breuer on (01) 434 2698/9 or if you prefer write to her at:

**Prescot Computers Ltd**  
43 Conduit Street, London W1.

14611

## INTERNATIONAL SOFTWARE ANALYST

Must be experienced in assembler language and mini or micro systems. A knowledge of European telephone systems is desirable. Join a development team in the US for 6 to 8 months then return to London where you will provide product support to our marketing staff and technical liaison with the US team. Position directly involves the design of new micro-based products aimed at telephone cost management systems. Excellent salary, rapidly growing US company and outstanding job challenge.

Please send CV to: **Sykes Dataconics Limited**  
Regal House, London Road  
Twickenham, Middlesex  
Telephone: 01-891 4796

## EUROPEAN MANAGER

For International Distributor Network

US manufacturer of floppy disc systems with UK headquarters needs experienced Marketing/Sales Manager—background in mini/computers, peripherals or communications equipment. Applicant needs 3/5 years' sales management background, some outside UK if possible, European language a plus. He will take charge of 10/12 distributors to support marketing, increase sales and coordinate their efforts. Applicant needs good technical background to enable him to support distributors. Some initial training in USA and UK, extensive travel, US company, good basic salary plus incentive bonus based on performance each year.

Please send CV to: **Sykes Dataconics Limited**  
Regal House, London Road  
Twickenham, Middlesex  
Telephone: 01-891 4796  
891 4796

14612

From nil to No. 1 in Data Entry in just 10 years is proof enough—Redifon means business. Now, with the launch of the R1800 Series and Viewdata Plus, Redifon certainly does mean BUSINESS. Or, to be exact, it is out to revolutionise the electronic office market.

Incorporating a new fast processor, this remarkable, 'user friendly' integrated Office System provides everything conventional viewdata can. Plus unique real-time interactive viewdata. Plus IBM 3270 pass through. Plus a host of terminals. Plus text processing. Plus a host of exciting new products for 1981.

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## Customer Engineers

Central & S. London  
N. London & Luton

If you have 2+ years' experience of computer equipment we can offer you full product training at our Crawley headquarters, then total responsibility for your own area.

Pay and conditions are what you would expect of a large, dynamic young company—attractive salaries commensurate with experience plus overtime, plus car, plus realistic expenses.

Your skills could be exactly those we need. Contact John Currey, Manager of our South-East Branch on 01-942 8900 Ext 248. Alternatively write for an application form to: The Personnel Manager.

**REDIFON COMPUTERS LIMITED**  
Kelvin Way, Crawley, West Sussex RH10 2U.  
A Member of The Freethorn Group of Companies.

14630

## Data Processing Manager

Systems and Programming c.£9,500

Backed by one of the world's largest engineering organisations, our client is currently making sustained investment in rationalising and developing its manufacturing base. A feature of this programme involves the strengthening of the management support functions and it is for this reason that our client now requires an experienced Systems Analyst to head a small development team in the North-West of England.

From a background in COBOL programming, you will work in close liaison with the parent company's modern hardware environment IBM 4331 DOS/VSE operating system. Your brief will cover

the effective functioning of the unit to rapidly extend computer utilisation in accounting, order processing, stock control and purchasing functions. Understandably, this will necessitate detailed involvement with user computer centre and parent company to introduce existing packages or develop specifications for new programmes.

If you have a good educational background and application experience in the above hardware within a manufacturing environment, this is certainly a good opportunity to take a significant step forward in your career with all the accompanying benefits this brings.

Please write enclosing full career details, naming companies to whom we should not forward your application, quoting ref. RPS 2, to Ian Lovatt, Account Executive, Royds Personnel Services, Royds House, Mandeville Place, London W1M 6AE.

**RPS**

Royds Personnel Services London Limited

14631

## SENIOR PROJECT MANAGER/LEADER AND SYSTEMS ANALYSTS

required with extensive experience in the design and installation of real-time direct data entry business minicomputer systems using high level languages.

Previous employment suitable applicants should have been mainly with a supplier of business systems.

Minnie are computer system suppliers with installations in City financial establishments and general commercial companies and have offices in E.C.1 and E.C.2. Salary range £7,500 to £18,000.

Telephone or write to: **Minnie Business Systems Limited**  
21 Dingley Road, London E.C.2

## SOUTH-WEST UNIVERSITIES REGIONAL COMPUTER CENTRE

University of Bath  
**VME/B SYSTEMS PROGRAMMER**

Applications are invited for the post of Systems Programmer in the Operating Systems team at SWURCC. The SWURCC is situated in the congenial surroundings of the University of Bath and is the regional computer centre for the South-West Universities Computer Network.

Operating Systems is a small team responsible for maintaining and developing the VME/B operating system on a powerful ICL 2980. Development projects include the programming in 83 (an Algol 88-like language) of the immediate developments include implementing the latest version of VME/B (8.10), modification of a locally developed high-level scheduler and improvements in communications software.

This is a challenging post requiring a self-motivated, quick-learning individual. Experience of VME/B in another large operating system and of designing and developing systems software would be an advantage. Training will be given where necessary. Salary in the range £6,500 - £9,500 (under review). Applications, by letter and in threefold form, may be sent to the Personnel Office, University of Bath, Bath BA2 7AY (0225-812441, ext. 1122). Reference 1122. Closes 15 March 1981.

## IMS DATABASE DESIGNER

AMSTERDAM  
Up to £ 550,- p.w.

We require an experienced IMS analyst/Data base designer with a minimum of 3 years current IMS experience. The primary function is to work within a team of analysts in the DBA group to evaluate and check Data base designs and modifications.

## IMS PROGRAMMER

AMSTERDAM  
Up to £ 450,- p.w.

This project require an experienced programmer with an indepth knowledge of PL/I as well as IMS DB/DC. He should also have had some experience with ASSEMBLER as the position is within an IMS DBA group as technical programmer.

## MVS SYSTEMS PROGRAMMER

HAMBURG  
Up to £ 500,- p.w.

The main task is to be responsible for the maintenance support of a stable MVS system. It is also envisaged that part of the time will be involved in evaluating and installing new utility software packages.

## MVS SYSTEMS PROGRAMMER

AMSTERDAM  
Up to £ 500,- p.w.

To be part of a team of systems programmers involved in a conversion from OS/VS1 to MVS. An indepth knowledge is required of ACF/VTAM, VSPC and if possible VSAM.

## IMS SYSTEMS PROGRAMMER

AMSTERDAM  
Up to £ 550,- p.w.

We are seeking an experienced IMS systems programmer with at least 2 years of current experience including release 11.6. The task will be to maintain the current system (which is in on MVS environment) as well as be involved in preparing for the installation of the next release.

## DOS/VSE SYSTEMS PROGRAMMER

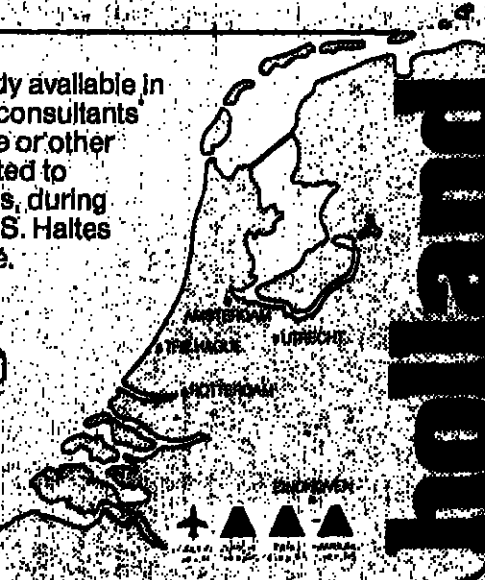
UTRECHT  
Up to £ 450,- p.w.

To assist in the conversion from DOS/VS to DOS/VSE as well as to be responsible for CICS support internally.

These projects are currently available in Holland and independent consultants who are interested in these or other future projects are requested to telephone, reverse charges, during normal office hours, to Mr. S. Haltes or to send a career resume.

**share**

P.O. Box 123  
1071 BL Amsterdam  
HOLLAND  
Tel. 010 31 20 79 60 11



**JBA**

## Consultants (RSTS/E)

Zurich, Luxembourg, Frankfurt c. £16,000+ Exps.

Our client, a Swiss Management Consultancy, with offices in the above locations wish to recruit professionals to strengthen their current project teams involved in the development and installation of banking systems throughout Europe. Ideal experience would be 3 years Basic + or Basic + 2 in a RSTS/E environment as a senior member of a development team. This being a permanent overseas appointment, candidates must be self motivated, adaptable and be prepared to travel between project locations when the need arises.

Contact: Brian Postles

## Field Service Engineers

Saudi Arabia up to £15,000 tax free plus allowances.

Our Client, a well established commercial organisation with many diverse interests, wishes to appoint two Customer Engineers to join a newly formed support group based in Jeddah. Candidates must have at least two years experience of serving DEC processors and peripherals. A recognised qualification and/or knowledge of software would be an advantage. A very attractive package on permanent married status.

Contact: Jim Baker

## Sales Consultants

Essex/Birmingham c. £13K + car

A leading, nationwide bureau organisation, are seeking experienced Sales Executives to contribute significantly to current expansion plans and develop their own customer base. You will be responsible for selling the bureau's wide range of data processing services, including application packages, terminal enquiry facilities and bespoke systems.

Main preferred qualities sought, are a sound understanding of business problems a proven sales record in a related field, and ideally, a background in accountancy or business systems. Targets are very realistic, and achievable, for salesmen with energy, initiative and the enthusiasm to succeed.

Contact: Brian Postles

## Communications Support

London £10,000

The Computer Services Department of this well known organisation, are seeking senior/junior technical expertise in the communications field. It is essential to have good experience of IBM 3270, SDLC, HDLC, X25 or Package switching.

For the more senior position, a background including communication system design is of utmost importance. A degree or equivalent qualification in Engineering or related subjects is mandatory for both positions. Good prospects and training will be offered.

Contact: Janet Chilvers

## Consultant

Quality Assurance to £10,000

Our client, a very successful consultancy has grown steadily in the extent and complexity of its operations. They are currently seeking a Software Engineer with the experience and ability to make an immediate contribution in a demanding team environment. The QA team works in close co-operation with Project Leaders and therefore have an opportunity to acquire a unique overview of the company's activities. The appointee will play a significant role in the audit and review of technically advanced applications with special reference to Defence projects. Applicants will be able to demonstrate a successful technical background which will include an appreciation of electronic engineering and QA procedures.

Contact: Margaret Stevens

## Programmers

City to £10,000

We have been retained by a British Merchant Bank to recruit two experienced COBOL programmers to supplement their existing teams. Current Hardware is HP 3000 using IMAGE, ASK and VIEW Software, so experience in these fields would be an advantage. Special preference will be given to applicants with banking background although insurance would be an acceptable alternative. Normal banking benefits apply.

Contact: David Hendry

## Mini Systems Analyst/Programmers

London to £8,500

Our client, **Enclon Consultancy International** requires Analyst/Programmers to join its **ENERGY SYSTEMS** division, helping to design and develop systems to manage the exploration, supply and use of Energy resources. Applicants must be self-motivated and should have at least 18 months experience of high-level programming (e.g. COBOL, FORTRAN, PASCAL) on mini-computers. On-line, database expertise would be an advantage. Successful candidates can expect to work on a variety of challenging projects in a demanding environment, the prospect of rapid promotion to project leading and consultancy roles.

Contact: Margaret Stevens

## Analyst/Programmer

London c. £8,500

A well established software house and systems consultancy, are expanding their London office and so have a requirement for analyst/programmers to develop and support turnkey projects based on the T1090 range of computers. Candidates must have at least 3 yrs. experience in d.p. preferably being gained in a mini environment, coupled with a sound knowledge of COBOL. An understanding, if not a working knowledge of systems in a financial area, would be an added advantage. Nothing in the company's products will be given. It is expected that the candidate be self-motivated as this is a responsible position.

Contact: David Hendry

**JAMES BAKER ASSOCIATES,**  
International Personnel Consultants,  
32 Savile Row, London W1.  
Tel: 01-439 9311.



## Merseyside Police Computer Unit

A newly created police computer unit serving one of Britain's largest police forces is currently preparing for the implementation of one of the most ambitious and prestigious computer based police systems in Europe. The first phase, due to go live early in 1982, is a real time continuous operation Command and Control System. The hardware consists of a dual Burroughs B5900 large systems configuration with an extensive communications network, and uses database software. The system will be installed in a new purpose built Police Headquarters in Liverpool City Centre.

The successful candidates for both posts will have had experience of two or more of the following:-

Burroughs Large Systems Database Software  
ALGOL and/or COBOL Real Time Systems

## Senior Systems Analyst

(Technical Support)  
(£8379 - £9861 p.a.)

The person appointed to this post will have prime responsibility for the Burroughs standard software and middleware on the system. The successful candidate will be expected to maintain such software, evaluate new software and new releases of software, advise on the relevance to the Force, and, where necessary, ensure that implementation is effected. This system has particularly sophisticated recovery and security facilities and these will be the responsibility of the Technical Support Analyst, who will also be expected to advise on methods of interfacing the system with the Crime and Criminal Information System, on which work has already started.

## Senior Systems Analyst

(Crime and Criminal Information)  
(£8379 - £9861 p.a.)

The person appointed to this particularly challenging post will work on the design of the second phase - a new comprehensive Crime and Criminal Information System, the first part of which is scheduled to go live in 1984. The detailed user requirement is almost complete and further expertise is now required to take responsibility for the production of the detailed specification, evaluation of proposals for implementation, and to supervise further developments in this field.

Re-location expenses of up to £1,250 will be paid in appropriate circumstances.

For further information telephone  
Ian Chambers (Computer Manager)  
on 051-708-6010 extension 8589

Application forms and further particulars available from  
The Chief Constable, (P.A.A.),  
Merseyside Police, PO Box 59, LIVERPOOL L69 1JD  
to whom they should be returned by 13th March, 1981.

## BRITISH COUNCIL FOR AID TO REFUGEES

require a

## COMPUTER OPERATOR

to operate a Commodore PET using information retrieval system. The successful applicant will also be expected, in conjunction with Consultants, to set up procedures covering all aspects of refugee data, expanding computer usage and establishing security of records. Some assistance with installation and general office work may be required.

Salary negotiable around £5,000 according to age and experience. Please send C.V. to the:

## PERSONNEL MANAGER

B.C.A.R.  
35 GREAT PETER STREET, LONDON, SW1

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## FROM DESIGN TO REALITY

**APL**  
ANALYST/PROGRAMMER  
An Analyst/Programmer is required to support users in the development of a corporate financial modelling system designed to provide information for planning, forecasts and budgeting. The successful applicant will be a trained systems analyst who understands the protocol of project management and management information systems. Programming experience using a high level language is essential and knowledge of APL is desirable.

You will be supporting a comprehensive EDP Development Plan which has broad objectives of improving customer service, sales, marketing and management information. To implement the plan several projects are phased over the period commencing with enhancements to existing systems and including total data analysis, investigation into automated office systems and redevelopment of Financial, Sales and Marketing, and Information Systems.

## THE COMPANY

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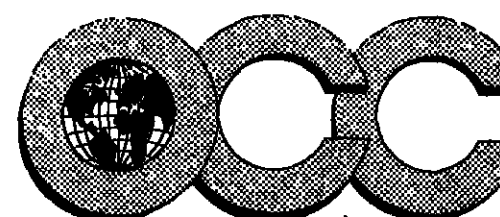
world's second largest brewer and has interests in property, chemicals, paper and packaging which combine to provide a solid platform for growth in the 80's.

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# Office of the future is on its way — but salesmen of the future are needed now

by Alan Simpson

SALESMEN are increasingly regarded as being in the front line of the company attack. They are also the first line of company defence, particularly when personnel cutbacks are taking place.

The recognition that selling is the most important part of any business activity has only recently been accepted in the U.K. That computing has had a large part in changing selling attitudes can be traced to the large number of US companies operating in the European marketplace.

However, getting into computing, at least for those on the outside, almost at any level, seems as difficult as microchip technology or satellite communication channels.

But with a current vacancy level of 50,000 in data processing, and increasing daily, the industry offers much recruitment scope, not least to salesmen. Many computer organisations, particularly those involved in selling software packages and the flourishing PC/M-DEM organisations, are complaining to anyone who will listen that their European growth and development plans are being hampered by lack of sales recruits.

Those not closely involved in the industry might be excused from believing that most growth is taking place in micro and word processing units. This is not the case. As the recently established recruitment company, Michael Drayton reports: The demand

events. Already there appear to be signs of a considerable pick-up in demand. The recession, far from harming computer sales, often serves as a bonus factor. Increasingly, companies are having to purchase or enhance computer systems as a

up selling organisations in Europe.

Hardware can range from a small-scale business or personal computer, a microcomputer system or a full-scale mainframe equipment. In between are all manner of peripherals such as printers and data preparation equipment as well as terminals, computer room environment systems and data communication products.

Earlier computing generations featured sales teams largely recruited from the universities. Graduates recognised the challenge and potential offered by the computer industry and climbed aboard the IBM, Burroughs, Honeywell or NCR bandwagons. Other salesmen "graduated" into full-scale computing via adding or accounting machine organisations. Some user personnel at the same time saw the sales opportunities (and rewards) and moved over into selling, as did many systems analysts and programmers. Even some service engineers crossed the lines to selling.

There is, unfortunately, no open door policy into computer selling. For a start, there would be just too many doors. Selling can involve software; computer software packages are now being actively promoted and a large number of US companies are setting

method of reducing clerical costs, improving customer services and supplying up-to-date management information.

method of reducing clerical costs, improving customer services and supplying up-to-date management information.

● A successful salesman should not have to wait long for internal recognition or for a rival company to come knocking with promising opportunities. There is certainly no shortage of computing companies starting up operations in Europe.

● Not all salesmen are whiter than white. Some are a deeper shade of grey who pack in their work cases a large quantity of wool which will hopefully cover customers' eyes.

seen not so much as a means of processing large amounts of data, but more as a total service and involvement in company affairs.

The salesman must therefore be self-confident, capable of communicating with all levels of company management and personnel, with an ability to diagnose problems and present cost-effective solutions.

Computing itself being largely a free enterprise concern, the salesman must show similar degrees of effort, achievement and self-motivation. Other major attributes must include enthusiasm, intelligence, plus a basic understanding of technology and what it can offer business.

This understanding can certainly be assisted by a degree in technology, business management or a related qualification. However, the ability to analyse customer requirements or to develop a new marketing plan or product line, is by no means limited to graduates. Irrespective of background, education or training, the successful salesman is most often the one with the ability to close a sale or to recognise a lost cause at an early stage.

As Alan Williams recently pointed out from the safety of the back pages of Computer Weekly, the failure to recruit new sales personnel is a direct factor in lost revenues and sales.

Decision often plays an important part in sales recruitment. The sales manager is possibly uncertain whether he can justify additional sales recruits, and the salesman uncertain whether he should risk

leaving his current company for ventures uncertain.

But not all salesmen are whiter than white. Some are a deeper shade of grey, who pack in their work cases a large quantity of wool which will hopefully cover customers' eyes. Bluffing (or perhaps baffling) the customer with super-hype jargon still takes place, particularly in the microcomputer software market. The Institute of Data Processing Management has now declared open hostilities against such activities and could attempt to draw up a code of good selling conduct.

Of the three main methods of job recruiting, advertising is probably the first to be considered. Positive factors include a pre-determined net, a wide catchment net, and some related company promotion. Drawbacks are the amount of sifting required and the information the opposition may have gleaned from the advertisement.

The main benefit of using a recruitment agency is that of time-saving both in preparing advertising copy and subsequent selection procedures. In either case, firm job specifications are essential for all parties.

The third method, that of direct approach, is normally restricted to very senior appointments or selected individuals. Casual sales pitching encounters often take place at such industry gatherings as exhibitions and conferences.

The Office of the Future may be round the next corner. But the demand for salesmen of the future is taking place right now.

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The position will appeal to a successful bureau Salesman with the skill and determination to build-up a Client base within the Midlands region. The Candidates must also have a natural business flair coupled with a successful sales record and knowledge of the current bureau industry. As this is a "start-up" situation it is imperative the Candidates should have a good working relationship with Computer Users in and around the Midlands area.

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## Communications Software

Southern Germany: Salary to £15K

Communications Engineers from Programmer/Analyst to Project Leader level are urgently required by one of Europe's leading suppliers of PBX and FAX equipment. Software development teams, based in their R & D Headquarters, are currently engaged in the design and construction of an advanced telephone system based on Intel 8086 microprocessors. All applicants must possess at least two years' real-time software development experience on any

leading mini- or micro-computer and be fluent in one high-level problem-oriented language such as PASCAL, CORAL or RTL/2. For the more senior positions it is also necessary to be familiar with an Assembler language and to be capable of supervising a team of up to 10 Programmers and Analysts. Initial interviews will be held in London and those who are successful will be invited to the Company's premises prior to offers of employment being made.

Ref. L/8/A

## Software Designers

Tees-side: Salary to £8.5K

A well-known Electronics Company with recent diversification into process control and medical computing is seeking several Software Designers and Programmers. The Company's system is micro-based and operates in a distributed processing environment. Particular programming experience must include one or more of:

CORAL 68, PASCAL, RTL2 or Assembler. Systems Software experience should include both device handlers and communication processors. You will play a large part in the specification, system design, implementation, test and documentation stages. Relocation assistance is available where necessary.

Ref. L/8/B

## IBM Systems Engineers

W. Germany: Salary to £20K

On behalf of an internationally renowned supplier of DBMS and TP Software Products we are seeking several IBM-orientated Systems Engineers with extensive knowledge of some of the following products and operating systems: CICS, IMS, MVS, TSO, ENVRON, TOTAL, IDMS or SHADOW. Technically, you must demonstrate 5 years' continuous exposure to the

implementation and/or Support of Data-Base and Teleprocessing systems in a large or multiuser IBM or Assembler installation. The company is offering superb permanent career positions in its new German office and offers higher than average salaries (even by Continental standards). There is a strong preference for those with a working knowledge of German.

Ref. L/8/C

## Real-Time Programmers

Central London: Salary to £9K

Additional Programmers are urgently required to join the Software development team of a small but expanding Systems House based in Central London. The company is currently engaged in the design, coding and testing of real-time software for U.K. and Overseas clients. Suitable applicants will have a degree

in a numeric subject and at least two years' real-time programming experience in either FORTRAN, CORAL 66 or Assembler. If you have been exposed to real computers, especially DEC's PDP range, PDP 11, Prime 500 or Honeywell Level 6, you will be of particular interest to our clients.

Ref. L/8/D

## Mini/Micro Software

EEC: Pkg. to £16K

Programmers, Systems Designers and Project Leaders with in-depth experience of real-time systems are urgently required to join a number of project teams in Continental Europe. Of particular interest will be candidates with a strong background in developing software for Communications or Process Control systems. Whilst all

applicants will be expected to be fluent in Assembler, Fortran, Algol or derivative languages, particular hardware exposure is not a requirement. All positions are on a permanent basis with relocation expenses and assistance in obtaining accommodation among the benefits our clients provide.

Ref. L/8/E

## Message Switching

Home Counties: Salaries to £13K

Senior Programmer/Designers are urgently required by a leading supplier of data and office communications equipment whose rapid expansion has led to a number of vacancies being created in their Software Development Department. Candidates should offer 3-5 years' Assembler programming ex-

perience in communications and networking environments. Whilst there is a preference for candidates who have worked on PDP11 minicomputers or leading microprocessors, particular hardware experience is not of paramount importance.

Ref. L/8/F

## Software Support

W. Home Counties: Salary to £13K

A leading Total Systems Supplier requires additional Analyst/Programmers and Project Leaders to join either its Customer Support or Software Development teams. Suitable applicants will have had previous communication skills and the ability to identify and solve client problems. It is essential for all positions that you offer at

least 12 months' experience of analysing commercial systems. Additionally, you should be fluent in Assembler, Basic, or COBOL and have recent exposure to mini- or micro-computers. Candidates who have actual or potential management abilities will of course be considered for the more senior positions.

Ref. L/8/G

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**SALESMAN**  
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A major organisation who are sole distributors of a leading mini/micro computer range are seeking a salesman for their range of products. It is essential that candidates for the position should have some experience within the computer or office equipment field.  
The person appointed could expect a basic salary in the order of £5,500 depending on experience plus an initial guarantee. The commission package is designed to produce an income of £17,500 for £100,000 of business. There are excellent prospects for advancement to management level within the company.  
Usual benefits apply.  
Ref: M14636

**BUREAU SALESMAN**  
Midlands  
Our clients, a large commercial bureau are currently recruiting experienced computer manufacturers, however applicants who have a proven track record in other spheres of activity in programme calculations or data processing will also be considered. The successful applicants will have a choice of offices in London and the Home Counties.  
Excellent company benefits are offered.  
Ref: M14637

**OPERATIONS**

**OPERATOR**  
Bury  
Our clients are seeking an operator with approx. 18 months' OS/VS, MVS experience together with a basic knowledge of teleprocessing applications. There is scope for advancement, and, among the many attractive benefits offered are two weeks paid holiday.  
Ref: BC4862

**OPERATOR**  
Essex  
Our clients, a well known consumer organisation have recently installed their first IBM mainframe and are now seeking operators with approx. 1 year's experience of OS/VS. The site operates a two shift rota and offers excellent scope for promotion. A profit share scheme is also offered.  
Ref: BC4863

**OPERATOR**  
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A large company in Essex require operators with at least one year's IBM experience. A two shift system is worked on IBM 4341 ODS VSE POWER. Fringe benefits include free medical, non-contributory pension scheme, a mortgage reduction and sports complex.  
Ref: M14638

**TRAINEE COMPUTER OPERATOR**  
Midlands  
We have been asked to assist with the recruitment of a trainee operator on a large IBM computer. Applicants must be aged from 18-21 years, have a good educational background and be of good appearance.  
Ref: BC4864

**OPERATIONS SUPERVISOR**

Essex  
We have been asked to assist in the recruitment of an Operations Supervisor. Applicants for this position should have an in-depth knowledge of ICL 1800/2800 (EXEC) together with previous supervisory skills to join this busy installation.  
Ref: M14639

**SENIOR OPERATOR/SHIFT LEADER**

London  
A leading financial organisation are seeking someone with at least 2 1/2 years' DOS/VSE POWER/CLICS experience together with the ability to supervise and be responsible for the shift. This £21 is due to go 'live' in April thus offering lots of scope for operational advancement.  
Ref: BC4867

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